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FISCAL INSTITUTIONS AND PUBLIC SPENDING VOLATILITY IN EUROPE

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Abstract

This work provides empirical evidence for a sizeable, statistically significant negative impact of the quality of fiscal institutions on public spending volatility for a panel of 25 EU countries in the 1980-2007 period. Following Fatás and Mihov (2003), the dependent variable is the volatility of discretionary fiscal policy, which does not represent reactions to changes in economic conditions and which may only reflect exogenous political preferences. Our baseline results thus give support to the strengthening of institutions to deal with excessive levels of discretion volatility. This relationship is based mainly on the fact that countries with more checks and balances make it more difficult for governments to change fiscal policy for reasons unrelated to the current state of the economy. Our results also confirm the findings of Furceri and Poplawski (2008) that bigger countries have less public spending volatility, while the stabilising function that bigger governments exert also contributes to lower policy volatility. In contrast to previous studies, the political factors do not seem to play a role, with the exception of the Herfindahl index, which suggests that high concentration of parliamentary seats in a few parties would increase public spending volatility. In addition, the run-up to EMU and the SGP dummies have the expected negative sign on policy volatility, while for the new EU members, the results also give some support to reduced levels of policy volatility, reflecting recent improvements in public finances.

Keywords: Fiscal policy, policy volatility, fiscal rules and institutions, European Union.
JEL Classification: E32, E62, H30.

INSTITUIÇÕES ORÇAMENTAIS E VOLATILIDADE DA DESPESA PÚBLICA NA EUROPA

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Resumo

Este trabalho documenta empiricamente a existência de um impacto negativo, de magnitude considerável e, estatisticamente significativo da qualidade das instituições orçamentais sobre a volatilidade da despesa pública para um painel de 25 países da UE no período 1980-2007. Seguindo Fatás e Mihov (2003), a variável dependente é a volatilidade da política orçamental discricionária, que não representa reacções a mudanças nas condições económicas e que pode apenas reflectir preferências políticas exógenas. Os resultados de base fornecem então, suporte para o fortalecimento das instituições de modo a lidar com níveis excessivos de volatilidade da política discricionária. Esta relação é baseada sobretudo no facto de que em países com melhores instituições é mais difícil aos governos alterarem a política orçamental por razões não relacionadas com o estado actual da economia. Os nossos resultados também confirmam os alcançados por Furceri e Poplawski (2008) de que países maiores têm menor volatilidade da despesa pública, enquanto que a função de estabilização exercida por governos maiores também contribui para reduzir a volatilidade da política. Em contraste com estudos anteriores, os factores políticos não parecem ser importantes, com excepção do índice de *Herfindahl*, que sugere que elevada concentração de assentos parlamentares em poucos partidos iria aumentar a volatilidade da despesa pública. Adicionalmente, as *dummies* para a UEM e para o PEC têm o sinal negativo esperado, enquanto que para os novos membros da UE, os resultados também fornecem algum suporte para níveis reduzidos de volatilidade da política, reflectindo melhorias recentes nas finanças públicas.

Palavras-chave: Política orçamental, volatilidade da política, regras e instituições orçamentais, União Europeia.
Classificação JEL: E32, E62, H30.

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1 Introduction

In the last decades, we have seen a general increase in government budget deficits along with large levels of public debt in most developed countries. Although the literature has focused on the main factors that help explain this deterioration of fiscal discipline, it has not given much attention to questions related to the aggressive use of fiscal policy.

Against this background, governments have been using discretion in fiscal policy for reasons not related to the current state of the economy, and this might increase the volatility of fiscal policy. In fact, fiscal policy is not conducted by benevolent governments, but rather by politically motivated executives who do not necessarily share the same preferences as those of the majority of society. For example, policies can be conducted for politically questionable reasons, which in general benefit only a minority of the population. This component of fiscal policy (we call it discretionary fiscal policy, following Fatás and Mihov (2003)), which may only reflect politicians' incompetence, greediness, and the opportunistic electoral and partisan cycles will be the object of interest in our work.[1]

Following this line of thought, the volatility of public spending would certainly rise with negative consequences for economic growth as it would produce high uncertainty surrounding the future path of fiscal policies, hindering the public's perceptions of its real effects and causing crowding-out effects on private consumption and investment. Regarding this problem, the literature has been debating whether governments should be constrained when conducting fiscal policy. Some (Levinson (1998) and Lane (2003)) defend that any kind of restrictions imposed on fiscal policy would reduce the ability of governments to smooth business cycles, while others (Alesina and Bayoumi (1996), and Fatás and Mihov (2003, 2006)) argue that the negative effects of high volatility caused by discretionary fiscal policies would

[1]The other two components are automatic stabilisers and discretionary fiscal policy that responds to the economic cycle.

outpace, or at least cancel out, the negative impacts related to less flexibility to counteract shocks. This debate has led to the improvement of budgetary procedures and rules towards strengthening institutions in order to keep sound public finances.

In this work, therefore, we want to find out if there is any link between stronger fiscal institutions (in line with the definitions contained in Hallerberg et al. (2007), Debrun et al. (2008), and Fabrizio and Mody (2008)), which are defined as the mechanisms and rules that create checks and balances on fiscal policy, and lower values of public spending volatility. Since we only want to capture the volatility embedded in discretionary actions that are simply the result of political motivations, we follow the definition for discretionary fiscal policy of Fatás and Mihov (2003), who define it as the component of fiscal policy that does not represent reactions to changes in economic conditions and that may only reflect exogenous political preferences. The volatility of this measure is built by taking the standard deviation of the residuals of a given fiscal reaction function.

In this context, our study adds to the "Fiscal Institutions" strand of literature in four ways. Firstly, we apply indexes for the quality of institutions to explain cross-country differences in policy volatility. Secondly, we cover the European Union (EU) countries, which offer several advantages, like larger span of data availability for more variables, and data quality and cross-country comparisons are likely to be of a high standard compared to samples with non-EU countries. Thirdly, we create panels of 10-year averages for the econometric specification, and this allows us to draw conclusions not only between countries as done by the majority of studies in this area of research, such as Alesina and Bayoumi (1996), Fatás and Mihov (2003, 2006), Afonso et al. (2008), Furceri and Poplawski (2008), but also over time, since we have, at most, three observations per country and not just one point in time. Finally, we use different measures of public spending and different specifications for the fiscal reaction function as robustness tests.

In a sample of 25 EU countries in the 1980-2007 period, our baseline results point

to a sizeable, statistically significant negative impact of the quality of institutions on public spending volatility, giving support to the strengthening of institutions to deal with excessive levels of discretion volatility. Our results also confirm the findings of Furceri and Poplawski (2008) that bigger countries have less volatility, while bigger governments are also associated with lower levels of volatility. In contrast with Fatás and Mihov (2003), and Afonso et al. (2008), the political factors do not seem to affect policy volatility, with the exception of the Herfindahl index, which suggests that high concentration of parliamentary seats in a few parties would increase public spending volatility. Notwithstanding, the results we get depend, to some degree, on the measure used for public spending. For instance, if we chose public consumption instead of primary expenditure (used in the baseline), none of the variables measuring the quality of institutions would be significant.

The remainder of the text is organised as follows. The next section briefly reviews the related literature on the use of discretion in fiscal policy and on the debate about the imposition of constraints on governments. Section 3 explains the empirical two-step strategy that will be carried out: for each country a measure of the volatility of discretionary fiscal policy is computed, and then it is employed as our dependent variable against a set of political, institutional and macroeconomic variables. Section 4 presents and discusses the baseline results, giving special focus to the quality of institutions. Under Section 5, we provide robustness results using different measures of public spending and different specifications for the fiscal reaction function. Finally, Section 6 concludes with the main findings and policy implications, providing some avenues for future research.

2 Literature

2.1 Governments' use of discretionary fiscal policy

Over the years, many papers on fiscal policy, such as Persson (2001), Persson and Tabellini (2001), Annett (2006), Fabrizio and Mody (2006), Hallerberg et al. (2007), Debrun et al. (2008), and Afonso and Hauptmeier (2009), have studied the determinants behind the systematic running of budget deficits and consequent accumulation of large levels of public debt, while others like Levinson (1998), Wagner and Elder (2002), Lane (2003), Alesina et al. (2007), Afonso et al. (2008), and Fatás and Mihov (2006, 2009), have focused on the cyclicality of fiscal policy, i.e. the ability of governments to react against output shocks. Though a few papers have addressed issues related to policy volatility, the literature on the volatility of discretionary fiscal policy is still scarce (see the pioneer works of Fatás and Mihov (2003, 2006)). Moreover, studies in this area for EU countries are even scarcer.

In our work, we follow Fatás and Mihov (2003), who define discretionary fiscal policy as the component of fiscal policy that is the result of exogenous preferences, unrelated to changes in economic conditions. The other two components of fiscal policy, which we do not cover in this work, are: automatic fiscal stabilisers, which consist of automatic responses of fiscal policy based on tax code and spending rules, to changes in GDP, and discretionary fiscal policy that responds to the state of the economy. We pursue a growing literature which brings economics and politics together to understand policy, and which has brought to the debate the idea that fiscal policy is not conducted by benevolent governments who have political motivations and seek the achievement of personal goals. That sort of behaviour would ultimately lead to bad macroeconomic policies. We want to stress that it is this volatility, caused by discretionary use of fiscal policy to achieve targets other than stabilising the economy, which do not respond to shocks and that only brings undesired volatility to the economy that we propose to study. We want to make clear

that we are only interested in politically motivated discretionary fiscal policy, and not in discretionary fiscal policy ("discretionary" as opposed to the operation of automatic stabilisers) that responds to economic shocks. For instance, a wide range of fiscal measures undertaken by governments to tackle the international financial and economic crisis, which began in late 2007, does not fall into the former category, as it aims to mitigate the adverse effects of the crisis.

Turning now to the reasons behind the use of discretion in fiscal policy, as we have mentioned, politicians can be motivated by personal objectives, generating too much volatility compared to what would be created if governments had only reacted to shocks suffered by the economy. This subject is intrinsically related to the emergence of the budget deficit bias, that is, too many deficits run by governments without adding significant growth to the economy. The "political economy" literature has advanced several factors as being behind the increased willingness of governments to resort to discretion in the conduct of fiscal policy, thus augmenting its volatility, as follows.

The opportunistic electoral cycle (Nordhaus (1975), and Rogoff and Sibert (1988)) arises when politicians in power run expansionary fiscal policy in times when it is not necessary, in order to maximize their chances for re-election.This behaviour is motivated by voters' fiscal illusion, which tends to delude citizens to privilege the short-term benefits they can get from lower taxes and higher public spending, at the expense of more sustainable long-term policies. In this regard, Persson (2001), and Persson and Tabellini (2001) present evidence in favour of an opportunistic political budget cycle in a panel of 61 democracies, with majoritarian elections being associated with stronger pre-election cycle in taxes, and proportional and parliamentary regimes being associated with large expansions in social transfers in the election year. Another related argument relies on the strategic behaviour of political parties, i.e. when politicians in power anticipate the possibility of not winning the next election, they would run high deficits and accumulate debt to condition

the policies of forthcoming governments. Similarly, idiosyncratic changes, incompetence and greediness, as argued by Stokey (2002), can foster large swings in the conduct of policies, generating excessive volatility without any gains to macroeconomic growth. The partisan electoral cycle advanced by Alesina (1987) can also help explain why some countries use more discretion in the conduct of fiscal policy. In his view, changes in policy may result from changes in the ideology of parties in power.

Finally, discretionary fiscal policy may stem as well from non-adjustment or delayed adjustment to shocks due to the inability to build coalitions. This behaviour is characteristic of proportional systems where the difficulty in forming majority governments by building coalitions with others parties, along with fiscal deadlocks, might delay stabilisation, increasing the volatility of fiscal policy (Milesi-Ferretti et al. (2002)).

2.2 Effects of discretion on the economy

In this section, we briefly summarise some negative effects of (high) discretion volatility that may weigh on the economy, which ultimately might create uncertainty among economic agents about future developments on fiscal policy. In this respect, we can also apply for discretionary fiscal policy volatility, some of the arguments present in Agnello and Sousa (2009), who advance some possible drawbacks of deficit volatility. We are assuming that discretion volatility generally stems from changes in expenditures, rather than from changes in revenues which normally reflect automatic responses to changes in economic conditions, i.e. cuts (increases) in taxes when the economy growth rate begins to fall (rise). Consequently, in our view, it is reasonable to assume that some determinants of deficit volatility can also have some effects on discretionary fiscal policy volatility. In the point of view of Agnelo and Sousa (2009), deficit volatility along with high public debt, may lead to higher interest rates than what they otherwise would be (through higher risk premium).

This would discourage investment and therefore may have dampening effects on growth. Investments would therefore privilege projects toward short-run gains at the expense of irreversible human capital losses. Greater uncertainty surrounding the future path of fiscal policies could hinder the public's perceptions of its real effects, which may cause crowding-out effects on private consumption and investment. Furthermore, as documented by Fatás and Mihov (2003, 2006), and Badinger (2008), excessive volatility in fiscal policies has significant negative impacts on output volatility, exacerbating the business cycle. Moreover, Ramey and Ramey (1995), Fatás and Mihov (2003), Furceri (2007),and Afonso and Furceri (2008) document that government spending volatility is detrimental to economic growth.

Only recently, with the persistence of high budget deficits and rising public debt among EU countries, have concerns about the sustainability of public finances been addressed. The Stability and Growth Pact (SGP) created by the European Commission in 1997 has been an attempt to discipline countries towards sounder fiscal policies. At the same time, almost everywhere, we have been observing changes in institutional design, with better and stronger institutions to deal with these issues. In this context, the debate around constraining fiscal policy discretion is taken up in the next section.

2.3 The need to restrain fiscal policy discretion

The problems which may arise from the aggressive use of fiscal policy discretion,[2] such as macroeconomic instability, raise some questions about whether tying governments' hands produces better outcomes than the option of leaving governments' actions unrestricted. If we look at what has happened to monetary policy all over the world, the idea that monetary policy agents must be independent of the political

[2]Although we are critics of the use of politically motivated discretionary fiscal policy, we acknowledge that some degree of discretion in fiscal policy may be very useful provided that it responds to shocks. However, authorities' use of discretion has to take into account the nature of the shocks. According to Baunsgaard and Symansky (2009), if the economy is hit by a supply shock, automatic stabilisers that enhance domestic demand would be self-defeating, and discretionary fiscal policy should be used instead.

power in order to guarantee that political authorities do not stimulate the economy ("fine-tuning"), is almost universally accepted. If monetary policy was available for authorities without any type of restrictions, it would produce higher levels of inflation and volatility with no additional gains to economic growth (the well-known inflationary bias). It was for this reason, in order to improve discipline and eliminate this bias, that monetary policy in several parts of the world was taken away from governments and was given to independent central banks.

In contrast to monetary policy, there is not yet any consensus among policymakers for restricting the ability of governments to use fiscal policy in an aggressive way. Nevertheless, this issue of "rules *versus* discretion", which is the trade-off between discipline and flexibility, has been in the forefront of the public debate, particularly in EU countries, where (since the creation of the single currency) policymakers have only had fiscal policy at their disposal to implement and to conduct their own policies. Following this line of thought, a growing body of literature has moved towards strengthening budgetary institutions, i.e. the mechanisms and rules governing the budget process that create checks and balances over public finances. This sudden interest in improving the quality of institutions is reinforced by the following aspects. First, there has been a sustained idea that institutions affect policy preferences directly, in the sense that limitations contained in the legislation condition the conduct of fiscal policy. Second, institutions can affect policy priorities as long as they are representatives of a wide range of citizens (Besley and Case (2003)). Thirdly, the deficit bias could be eliminated or reduced with a proper design of the institutional environment. Finally, improving the quality of institutions could drive up economic performance against the traditional view of only having the preoccupation to have low levels of inflation, contained budget deficits and exchange rate stability. For instance, Henisz (2000) has built a measure of political constraints that is found to have positive effects on economic growth.

Defenders of using discretionary actions in fiscal policy without restrictions ar-

gue that any sort of constraints having the ability to limit the intervention of the authorities in the economy would exacerbate the amplitude of business cycles, as they tend to produce more pro-cyclical fiscal policy, as evidenced by Levinson (1998) and Lane (2003). In particular, Levinson (1998) found evidence for economic costs in the US states in the form of increased business cycle volatility, as a result of tying government's hands, reducing therefore their ability to smooth out economic cycle fluctuations. In this regard, fiscal controls would not only limit the scope for discretionary public policies, but also the effectiveness of automatic fiscal stabilisers. During downturns, automatic stabilisers could not have operated if a balanced budget rule or any other type of rule that sets a ceiling on the budget balance or expenditure was in force. The overall result would be a weaker response of governments to output shocks.

On the other hand, there is a plethora of economists, for instance Poterba (1994), Alesina and Bayoumi (1996), Woo (2003), and Fatás and Mihov (2003, 2006), advocating that politicians could not conduct fiscal policy of their free will because they would run high deficits and generate too much volatility in the economy since fiscal policy can be a source of macroeconomic instability, even though it can also be a powerful tool to expand the rate of economic growth. Only by imposing tight restrictions on governments, whether in the form of explicit or implicit constraints, is it possible to eliminate, or at least reduce, the possibility of fiscal policy being itself a source of economic instability.[3] Fatás and Mihov (2003) argue that the chain through which policy volatility affects economic growth starts with the political and institutional setup underlying the conduct of discretionary fiscal policy, which in turn affects output volatility, and this will determine, to some degree, the rate of growth of the economy. In fact, if one country had tighter institutional constraints, it would have more stable policy, which would create the ideal conditions for a

[3]Automatic stabilisers, as opposed to what has been said by the authors against the impositions of restrictions, seen from this perspective, would still do the job of counteracting shocks to the economy, since discretionary fiscal policy is the one that would be restrained and not automatic stabilisers.

greater stability in the levels of private investment, as firms would be able to more accurately predict the path of public spending. This would promote further stability in output volatility as investment is one of the most volatile components, and finally would generate a more favourable environment for economic growth. Therefore, strengthening the quality of institutions would be the key to deal with the abusive use of fiscal policy, promoting sound fiscal discipline.

The proposals range from simple measures to increase governments' accountability and transparency of their policies, to more radical ones as proposed by Wyplosz (2005). He defends radical changes in policy-making by delegating the power to determine the size of the budget deficit to an independent fiscal policy committee. Others have studied the implementation of fiscal controls in the form of numerical fiscal rules applied to the budget balance and to its aggregates (Debrun et al. (2008)), and to procedural rules governing the budget process (Gleich (2003), Yläoutinen (2004), Fabrizio and Mody (2006), and Hallerberg et al. (2007)). All these authors share the same idea about the environment in which fiscal governments conduct policies, that is, they consider that the behaviour of fiscal policy depends on the institutional settings under which policy is implemented and thus, constraints could be effective in improving fiscal discipline.

Up until now, we have focused on restrictions in a broader sense. Going deeper into the subject, the literature has come up with the terms "Political or Fiscal Institutions" or simply "Institutions", to refer to various characteristics of the socio-economic and political setup of a given country, which considerably shape economic policy (Persson (2001), and Persson and Tabellini (2001)). This set of characteristics entails different types of restrictions covering a variety of topics of the political and institutional arrangement in the form of explicit limits, such as fiscal rules, and in the form of implicit limits, like procedural rules governing the budget process, the nature of the electoral and political system, ideological preferences, party concentration in parliament and number of elections, among others.

The main restrictions that are in force in many EU countries, and which we expect to have a role in explaining differences in policy volatility among these countries, will be briefly explained in the next two sub-sections. We group them into two main categories: numerical fiscal rules and fiscal governance.

2.3.1 Numerical fiscal rules

In the context of an increasing integration of countries in the Economic Monetary Union (EMU), efforts have been made to improve discipline in public finances. Despite the growing criticism and scepticism over the SGP, it appears to have had some positive results in controlling budget deficits and public debt. However, the recent improvement could be due more to the effectiveness of fiscal rules implemented at a national level rather than the merit of the SGP rules. For instance, at the national level, we can encounter budget balance and debt rules, which continue to be by far the most popular type of rules in the EU countries; at a smaller scale, we can also find rules applied on revenues and expenditures aiming to rebalance the composition of the budget by setting a cap on the annual growth rate of determined expenditure categories, and at the same time, by taking action to avoid an excessive tax burden. In general, those fiscal rules were implemented to take care of the deficit bias, the massive amounts of indebtedness, and to a lesser extent to "oblige" countries to pursue counter-cyclical fiscal policies, especially in good times.

Going forward, in the empirical analysis we are going to focus on the "Fiscal rule index" built by Debrun et al. (2008), who covered numerical fiscal rules implemented at a national level in EU countries to study the impacts on budget outcomes. Their main conclusions point to a significant positive impact of the index on fiscal discipline. In fact, fiscal rules, may not only eliminate excessive deficits and reduce unsustainable levels of public debt, but we expect that they may also work as a means to diminish discretionary fiscal policy volatility, preventing large deviations in fiscal policy, as rules "seek to confer credibility on the conduct of macroeconomic

policies by removing discretionary intervention", as stated by Kopits (2001). Afonso and Hauptmeier (2009) in a study for the EU countries have also used the "Fiscal rule index", to show that a well-defined and appropriate institutional design of fiscal rules may help promote fiscal consolidation and can help attain a sustainable fiscal position. Additionally, Fatás and Mihov (2006) studied the imposition of political and institutional restrictions on fiscal policy in US states, focusing on the cyclicality of fiscal policy. They found that states that apply a no *carryover* rule[4] experience less policy volatility. Alesina and Bayoumi (1996) stressed the important role played by fiscal rules in improving fiscal discipline in the US.

2.3.2 Fiscal governance

A growing body of empirical and theoretical literature that has dealt with issues related to the quality of institutions has also focused on implicit constraints underlying the three phases of the budget process: (i) the *Preparation stage*, in which the budget draft is elaborated; (ii) the *Approval stage*, in which the budget draft is reviewed, approved and then formalised; and (iii) the *Implementation stage*, where the budget is implemented and which may be subjected to modifications or amendments by the minister of finance and/or by the parliament. They consider these set of variables of fiscal governance as complements to numerical fiscal rules rather than mutually exclusive, since strengthening institutions requires both improvements in procedural rules and in ex-ante fiscal rules which fix numerical targets or ceilings for fiscal targets.

We expect stronger institutions with more checks and balances to have positive effects in constraining discretion in fiscal policy, i.e. we are led to believe that countries with better and more developed institutions face more difficulties to change fiscal policy for reasons not related to the current state of the economy. In fact, the literature has found evidence for a direct relationship between tight procedural

[4]States having this type of rule cannot carry over a budget deficit to the next budget year.

rules surrounding the budget process and fiscal discipline. One of the most important papers in this area of research is Hallerberg et al. (2007). They claim that tight implicit restrictions in the budget process are associated with better fiscal performance. Notwithstanding this finding, they stress the importance of taking into account the prevalent political regime and the type of government in order to achieve fiscal discipline in an efficient way. In countries with single-party governments or coalition governments, where parties are closely aligned and where political competition among them is low, fiscal discipline is achieved by delegating the decision-making power to the minister of finance - *Delegation*. On the other hand, where ideologically dispersed coalitions dominate and where competition between them is high, fiscal contracts that require countries to set multi-year targets should be implemented to achieve fiscal discipline - *Commitment*. Another type of (implicit) restrictions that has been studied relates to the nature of the political and electoral system, the influence of elections, party concentration in parliament, the instability of governments, among others. Persson (2001), and Persson and Tabellini (2001) constitute a remarkable approach on some of these issues for a large sample of countries.

Drawing on the above mentioned literature, we propose to study the direct link which operates between political and institutional restrictions, and discretionary fiscal policy volatility in the EU countries. We will also focus our attention on some macroeconomic variables, which we expect to be important determinants to justify differences in volatility between countries.

3 Empirical strategy

After dealing with the theoretical aspects of discretionary fiscal policy, we propose to study the main determinants of its volatility through a two-step strategy. Firstly, we extract from each country the exogenous component of fiscal policy that is not

related to the current state of the economy. Secondly, we employ our measure of the volatility of discretionary fiscal policy as the dependent variable against a set of political, institutional and macroeconomic variables. From now on, the terms public spending volatility, (fiscal) policy volatility, and discretionary fiscal policy volatility will be used interchangeably throughout the text.

3.1 First-stage regressions: measure of discretionary fiscal policy

Our sample covers 25 EU member states over the period 1980-2007.[5] Studying this sample of countries offers several advantages. First, we have a larger span of data availability for more variables than those that would be obtained from non-EU countries. Second, data quality and cross-country comparisons are likely to be of a high standard for the EU countries. We use annual data from the European Commission (EC) AMECO database, Spring 2009 vintage, for all fiscal and macroeconomic variables. In principle, we would only want to consider data conforming to the ESA 95 accounting system, but since we have some missing data in some countries for early years, it was also necessary to resort to data conforming to the ESA 79 standards. In these cases, the series were completed backwards using annual percentage changes implied in ESA 79 (Table 13 of Appendix C presents a complete list of ESA 79 data that were used to complete missing data). For the political variables we use data from the Database of Political Institutions (DPI 2006) of the World Bank, while data for the institutional ones come from the Cross National Time Series Database (CNTS).

Turning now to the empirical strategy, in the first stage, we want to build a measure of discretionary fiscal policy that is driven by political and personal motivations, which do not constitute changes as a result of the effects of the economic cycle on fiscal policy. In order to do this, we need to separate the cyclical compo-

[5]Bulgaria and Cyprus were dropped due to data availability problems.

nent of fiscal policy, i.e. the endogenous response to changing economic conditions which are largely outside the control of fiscal authorities (also called discretionary fiscal policy that responds to shocks), from exogenous (structural) changes in policy stance (politically motivated discretionary fiscal policy). This latter component can be thought of as a shock to the economy that is harmful to growth. However, separating these components of fiscal policy turns out to be a hard task, which is subject to controversial issues and where it is not possible to draw definite conclusions on which method is better or worse than the alternative. The difficulty lies in the simultaneity in the determination of output and the budget. Alesina and Perotti (1996) tried to tackle this problem by surveying some proposals of the literature aiming to capture the exogenous component of fiscal policy (they refer to fiscal impulse measures). The measures range from the simplest one (change in primary expenditure), to the Blanchard, OECD, and IMF measures. They end up choosing the Blanchard measure as the most appropriate, due to its simplicity, and to the fact that it does not require resorting to potential output estimates, which can be very subjective. According to the Blanchard measure, government expenditure is expressed as a function of the unemployment rate of the previous year.

We rely instead on the pioneering[6] work of Fatás and Mihov (2003), who consider the residuals from a regression of government consumption growth on output growth, lagged government consumption growth and on other controls, as a quantitative estimate of discretionary fiscal policy. Though following their econometric approach, we do not use real public consumption as the baseline measure of public spending, but rather we use real primary government expenditure as the dependent variable.[7] As in the previous work, the use of spending variables rather than revenues or the budget balance is justified by the fact that expenditures react much less to the

[6]In spite of the fact that other papers had already treated these residuals as a government spending shock (for example, Blanchard and Perotti (2002)), the truth is that, to our knowledge, Fatás and Mihov (2003) were the first to centre the analysis on the aggressiveness of discretionary fiscal policy.

[7]We do not consider total expenditures since interest payments are mostly not under government control in the short run.

cycle than revenues; in fact, fluctuations in revenues result, to a large extent, from the automatic reaction of tax revenues to the state of the economy. We believe that the referred endogeneity bias (simultaneity in the determination of output and the budget) could therefore be reduced in some degree. In addition, using the EU countries allows us to employ a broader measure of government spending, since data are available and comparable across countries (as in compliance with the ESA 95 accounting system). This contrasts to the one of Fatás and Mihov (2003), whose choice of government consumption as the indicator of fiscal policy was dictated by data availability, since it is difficult to gather internationally comparable data for broader measures of government spending for a large cross-section of countries (they focused on 91 countries). Hence, by overcoming the latter drawbacks, we can have more confidence in the generality of our results. Additionally, for the sake of comparison with the literature's results elsewhere, we also provide results in the case of government consumption as the measure of fiscal policy.

From an econometric point of view, we estimate for each of the 25 EU countries for the period 1980-2007, the following equation based on Fatás and Mihov (2003, 2006):[8]

$$\Delta \log(G_{i,t}) = \alpha_i + \beta_i \Delta \log(Y_{i,t}) + \delta_i \Delta \log(G_{i,t-1}) + \lambda_i Z_{i,t} + \epsilon_{i,t} \qquad (1)$$

where Δ is the first difference operator, G stands for real primary government expenditure in country i and time t, Y is real GDP, and Z includes a set of control variables, namely, inflation, inflation squared, the logarithm of current and lagged oil spot prices, and a linear time trend. Inflation is included to ensure that our results are not driven by high inflation episodes and to control for the possibility that specific spending items are indexed automatically to the inflation rate. The inclusion of inflation squared is justified by the possible existence of a nonlinear re-

[8]Our equation combines variables from the equations of these two papers. For example, the first paper does not directly include oil prices as an explanatory variable, in contrast to the second.

lationship between inflation and government outlays. In turn, oil prices are included because they affect the state of the economy, while the inclusion of a linear time trend is vindicated by the argument that government spending might also have a deterministic time trend in addition to the stochastic one.

The possible reverse causality bias running from public expenditure via domestic demand to output growth is accounted for by using the instrumental variables (IV) estimator. We use two lags of GDP growth, lagged inflation and the logarithm of oil spot price as instruments for current output growth.

Finally, and more importantly, the volatility of residuals ($\epsilon_{i,t}$) can be seen as a quantitative estimate of discretionary fiscal policy. The volatility is calculated as the standard deviation of the residuals in country i, and we interpret sigma (σ_i^{ϵ}) as the typical size of a discretionary change in fiscal policy.

As a robustness test, we also provide another way of calculating the measure of discretionary fiscal policy by resorting to a different equation (Fatás and Mihov (2009)). Equation (2) therefore presents a fiscal policy reaction function, commonly used in the literature, where government spending reacts to cyclical fluctuations, past developments in public debt, and to its own past values:

$$G_{i,t} = \alpha_i + \beta_i Gap_{i,t} + \gamma_i D_{i,t-1} + \delta_i G_{i,t-1} + \omega_{i,t} \tag{2}$$

where G is the cyclically adjusted primary expenditure (CAPE),[9] *Gap* is the output gap measured as the difference between actual and potential output at constant market prices, whereas D is gross government debt. All variables are expressed in percentage of potential output, computed according to the production function method. To avoid the possibility of endogeneity bias, we instrument for the output gap using two lags of the own output gap, lagged inflation and the logarithm of oil spot price. Again, we interpret the country-specific volatility of the error term (σ_i^{ω}),

[9]We also estimate the equation using consumption expenditure in percentage of potential GDP. However, in contrast to CAPE, it is not cyclically adjusted since its components are usually regarded as not responding automatically to the cycle.

as the typical size of a discretionary change in fiscal policy for country i.

Going further ahead, we have computed the standard deviation using periods of 10 years, since we want to capture long-term fluctuations in discretionary fiscal policy, removing therefore the noise that might exist in the short-term. Table 1 presents Spearman's rank order correlation for the four different dependent variables that we have used, to test if the ranks obtained will be correlated between each other. The main conclusion is that it is not irrelevant which variable is used to compute the volatility of discretionary fiscal policy, i.e. we can obtain different empirical results as the ranks obtained differ considerably. For example, for the 1990 decade, even though there is positive correlation between all variables, there is no statistical evidence (at the 1 per cent level) that permits us to confirm that we will obtain similar results regardless of the measure that is used. For the other decades we find similar conclusions. For instance, in the last decade, Poland has the lowest value of policy volatility when we use primary expenditure as the dependent variable (Discretion 1), but if we consider instead consumption expenditure (Discretion 2), it would have the highest score of policy volatility.

Taking our baseline measure of the volatility of discretionary fiscal policy, i.e. obtained by employing primary expenditure as dependent variable in Equation (1), Figure 1 of Appendix C presents the calculated volatilities (expressed in standard deviations) of discretionary fiscal policy for each country and decade. In the 1980s, we only have data available for the former EU-15 countries, with policy volatility ranging between a maximum of 10.1 (Greece) and a minimum of 1.1 (Netherlands). Adding one more decade, and including three new countries (Estonia, Latvia and Slovakia), does not significantly change the overall picture presented in the previous decade. Finally, in the last decade, we cover all the 25 countries, where the discretion measure ranges between 6.7 (Latvia) and 0.7 (Poland). Overall, over time, the charts show a slight downward trend in the use of discretionary fiscal policy across countries, albeit with some exceptions.

Table 1: Spearman rank order correlations by decade

1980	Discretion 1	Discretion 2	Discretion 3	Discretion 4
Discretion 1	1.000			
Discretion 2	0.804*	1.000		
Discretion 3	0.621	0.425	1.000	
Discretion 4	0.614	0.671*	0.579	1.000
1990				
Discretion 1	1.000			
Discretion 2	0.382	1.000		
Discretion 3	0.625	0.421	1.000	
Discretion 4	0.589	0.621	0.536	1.000
2000				
Discretion 1	1.000			
Discretion 2	0.337	1.000		
Discretion 3	0.824*	0.484	1.000	
Discretion 4	0.401	0.639	0.400	1.000

Note: * indicates statistical significance at the 1% level. Discretion 1 and 2 refer to equation (1) where we used primary and consumption expenditure as dependent variable, respectively. Discretion 3 and 4, refer to equation (2) where we used the ratios of CAPE and consumption to potential output, respectively.

3.2 Second-stage regressions: determinants of policy volatility

Having explained how we have built our measure of discretionary fiscal policy volatility, we now turn to some of the most promising variables to explain cross-country differences in policy volatility: the Fiscal rule index (FRI) and the Delegation index, and their respective sub-categories. Regarding the FRI, which is taken from Debrun et al. (2008), the literature has found statistically significant positive effects of this index on budget outcomes, as we have stressed in Section 2.3.1. So, it is reasonable to argue that it is also expected to restrain discretionary changes in fiscal policy. The FRI is restricted to fiscal rules that fix targets or ceilings to budgetary aggregates expressed in numerical terms. The final objective is to cover all numerical fiscal rules in force that somehow restrain the conduct of fiscal policy, while at the same time try to measure its relative strength (degree of effectiveness). One additional

advantage is that, in contrast to most of the other papers, the index may vary over time and not only across countries.[10]

Finally, in addition to explicit rules governing the conduct of fiscal policy, we also want to address the implicit constraints faced by policy-makers in the various phases of the budget process. The so-called fiscal governance variables are based on the works of Hallerberg et al. (2007), and Fabrizio and Mody (2008). We would want to demonstrate to what extent implicit constraints, which help improve the quality of institutions, affect policy volatility. We base our reasoning on the finding that stronger institutions do not allow governments to abruptly change fiscal policy for reasons not related to the business cycle. We use the referred works to build our indexes of Delegation, Preparation, Approval and Implementation. The complete list of items and institutional scores constituting the index are shown in Table 11 of Appendix B. The construction of the Delegation index and of its sub-categories assumes that individual institutional features are perfect substitutes, so we add up all institutional items assuming that each item of each phase will have equal weights to the aggregation process:

$$\textit{Preparation index} = \frac{1}{3}\sum_{i=1}^{3} x_i, \qquad x_i = \text{items 1 to 3 of Table 11} \tag{3}$$

$$\textit{Approval index} = \frac{1}{3}\sum_{i=1}^{3} x_i, \qquad x_i = \text{items 4 to 6 of Table 11} \tag{4}$$

$$\textit{Implementation index} = \frac{1}{4}\sum_{i=1}^{4} x_i, \qquad x_i = \text{items 7 to 10 of Table 11} \tag{5}$$

Taking the simple average of the sum of each institutional phase, we obtain:

$$\textit{Delegation index} = \frac{\textit{Prepar. index}+\textit{Approv. index} + \textit{Implem. index}}{3} \tag{6}$$

Table 12 summarises the data on the Delegation index and on the FRI for each

[10]See Appendix B for a brief explanation on how the index is built. For a thorough explanation of all topics covered in the survey, and its technical aspects, see Appendix 1 in Debrun et al. (2008) or Chapter 3 of Part III in European Commission (2006).

country and for each of the three decades considered. Firstly, a country with high numerical fiscal rules does not necessarily have tighter controls over the budget process. In fact, the simple correlation between the FRI and the Delegation index is not very significant, reaching almost 0.3 in the 1990s and around -0.1 in the last decade. For example, in the 2000s, Denmark and Finland have lower levels of the Delegation index but high values of the FRI, while Ireland and Greece are good examples of the opposite case. Secondly, over the last decade, there has been a broad based increase in the quality of institutions (see the two last columns).

After taking some considerations on the main indexes that will be in the centre of the analysis, we now focus on the econometric specification for the second stage regression. At this stage, we try to include all the variables and controls that might be important to explain differences in policy volatility between countries. Taking the logarithm of policy volatility, calculated in Section 3.1, as the dependent variable of interest, we perform the following regression by Ordinary Least Squares (OLS):

$$\log(\sigma^{\epsilon}_{i,t}) = \alpha_i + \beta_i FRI_{i,t} + \chi_i Delindex_{i,t} + \delta_i Pol_{i,t} + \phi_i Inst_{i,t} + \gamma_i M_{i,t} + \theta_{i,t} \quad (7)$$

FRI is the Fiscal rule index, while *Delindex* reflects our measure of the Delegation index as explained above. In addition to the *FRI* and the Delegation index, we also use the sub-categories of both indexes. *Pol* includes all the political variables that shape budget outcomes, namely the nature of the electoral system (governments elected by proportional representation or by majoritarian circles), the number of parliamentary elections to capture the possible presence of a political budget cycle, an index of electoral competitiveness that may help improve checks and balances and political stability, and the Herfindahl index that measures the concentration of power in the parties, given by the following formula:

$$Herfindahl\ index = \sum_{i=1}^{N} \left(\frac{\text{No. of seats of } party_i}{\text{Total seats}} \right)^2, \quad 0 \leq Herf.\ index \leq 1 \quad (8)$$

Contrary to most of the literature focusing on political variables, it was not possible for us to use the nature of the political regime (parliamentary *versus* presidential regimes) owing to few differences between EU countries. In our sample, indeed, only Lithuania and Poland have presidential regimes. This political feature makes more sense in a large international sample of countries where there are large differences in the prevailing political regime.

The occurrence of political crises that may remove from power a particular government and the instability that many cabinet changes might bring to the executive is captured by the vector *Inst*, which includes the variables, government crises and cabinet changes.

We have also included some macroeconomic control variables found by the literature to be of potential importance for explaining budget outcomes. The vector M comprises the following variables: GDP per capita to capture income effects, government size to control for the stabilising role of fiscal policy, country size and dependency ratio to capture key social characteristics that affect policy volatility, openness to control for the degree of exposure of economies to external shocks, inflation is justified by the possibility that high inflation episodes will induce higher price volatility, which could lead governments to make large deviations in public spending in general and in discretionary spending in particular as a result of higher uncertainty, and dummies for the run-up to EMU, for countries constrained by the SGP and for new members of the EU, the Central and Eastern European Countries (CEEC), in order to assess the relevance of the different stage of each country in the integration process.

Regarding the econometric estimation method, our data does not allow us to employ common panel data estimators, such as fixed and random effects estimators, since we have some variables, such as political and fiscal governance variables, with little or no time variation at all within each country. For example, using the fixed effects estimator would lead the model to drop some time-invariant variables, re-

ducing the availability of non-zero observations. For these variables, heterogeneity is mainly found between countries and not within countries. So, to account for the potential problem of heterogeneity, we include in Equation (7) a large set of other variables aiming to capture cross-sectional heterogeneity, and at the same time, by doing so, we minimize the risk of an omitted variable bias. Another problem posed by our estimation refers to the fact that the dependent variable is estimated rather than observed, which would lead to higher standard deviations lowering the t-statistics, thus reducing the overall quality of our results. According to Furceri and Poplawski (2008), the regression residuals obtained from the first stage can be thought of as having two components: sampling error, the difference between the true value of the dependent variable and the estimated one; and the random shock in the residual term that would have remained even if such deviations had not occurred, i.e. the structural innovations in the endogenous variables. So, to minimize this problem, we use panel-corrected standard errors when computing the standard errors of the estimates. This method assumes that the disturbances of the variance-covariance estimates are heteroskedastic (each country has its own variance) and contemporaneously correlated across panels (each pair of countries has their own covariance). Additionally, we also tried to employ time-effects on the regressions by creating dummies for each decade. However, we were forced to drop them from the regressions, since they proved to be insignificant in most regressions.

4 Baseline Results

4.1 Delegation index

In this section, we perform empirical estimations for the EU countries using Equation (7). Despite the difficulties in addressing the time-variation in our data series, we attempt to provide estimations that may not only reflect cross-country variation but also within-country variation. To be able to do so, we create a panel of three con-

secutive, non-overlapping 10-year averages from 1980 to 2007.[11] With this method of pooling observations (pooled OLS), we will have, at most, three observations per country. We estimate Equation (7) by OLS with panel-corrected standard errors. In some tables, generally the last column(s), we also perform estimations using Two-Stage Least Squares (2SLS) to account for possible reverse causality running from policy volatility to institutions.

In our work it is not only possible to exploit the effects of explicit constraints on policy volatility (numerical fiscal rules) but also implicit restrictions (fiscal governance variables and the political and institutional design). We therefore extend the analysis of Fatás and Mihov (2003), who have only focused on implicit restrictions (index of political constraints constructed by Henisz (2000), the nature of the political and electoral systems, and number of elections), due to the few explicit constraints existing in their sample of countries.

Moving forward, in Table 2 we focus on the factors that influence policy volatility, giving special attention to our index of Delegation, which tries to capture the implicit institutional arrangements faced by policy-makers when preparing, approving and implementing the budget. In column (1), in a bivariate regression, a one-standard deviation increase in the Delegation index[12] would decrease policy volatility by about 12.5 per cent.[13] This is the expected effect, as the quality of institutions, i.e. more checks and balances faced by politicians, prevent them from using fiscal policy for reasons not related to the current situation of the economy.

In column (2), we assess the role played by the political variables. Our results imply that countries with proportional systems have, on average, twice as much volatility of discretionary fiscal policy (around 95 per cent) compared to majoritar-

[11]The first decade goes from 1980 to 1989, the second from 1990 to 1999, and the last decade uses the last 8 years in our data set.

[12]This is the usual interpretation of the coefficient since the Delegation index was normalised to have zero mean and standard deviation equal to one.

[13]The coefficients' quantitative impact on policy volatility is more accurate if we take the exponential of each coefficient. In this case, the semi-elasticity of policy volatility with respect to the Delegation index is 12.5 per cent (exp (-0.133)-1).

ian systems. This is in line with the findings of Alesina and Perotti (1994), who argue that proportional systems lead to coalitions and fiscal deadlocks which delay stabilisations and thus create more volatility in the unexplained component of fiscal policy. The concentration of parliamentary seats in a few parties (the Herfindahl index) would induce an increase in policy volatility by around 22.7 per cent for each additional tenth of a point index.[14]

Regarding the variable elections, an extensive strand of literature has tested whether governments nearing an election choose to loosen fiscal discipline, engaging in excessive spending or/and cuts in taxes to ensure future re-election and thus creating more policy volatility, or whether elections keep policy-makers accountable, preventing them from engaging in idiosyncratic or opportunistic fiscal policy manipulation. Annett (2006), Hallerberg et al. (2007), and Afonso and Hauptmeier (2009), claim that there is evidence of a political budget cycle played by the existence of elections in a given year, that is, elections negatively impinge on the improvement of the fiscal position. In contrast with the previous views, we find a negative sign of elections on policy volatility, which corroborates the findings of Fatás and Mihov (2003) that elections hold politicians accountable. Nonetheless, this result should be interpreted with due care as it is not statistically different from zero at conventional levels.

In column (3), we add two institutional variables, which are key determinants to explain public deficit volatility in Agnello and Sousa (2009), which try to capture government stability whether in the form of the number of cabinet changes or by the existence of government crises. However, they turn out to be statistically insignificant.

Including the macroeconomic and other control variables (column (4)) strongly increases the fit of regression (R-squared of 0.375) suggesting that these variables account for a large portion of the variability in policy volatility, while the Delegation

[14]It should be recalled that the Herfindahl index spans between 0 and 1, with higher values corresponding to higher concentration of power in the parties.

index is still highly robust to these different specifications. Focusing on the macroeconomic controls, we expect to observe a negative coefficient of GDP per capita, since according to Fatás and Mihov (2003), it is likely that poorer countries have a more volatile business cycle due to less developed financial markets, and at the same time, may resort more often to discretionary fiscal policy. Surprisingly, the coefficient of GDP per capita turns out to be positive, indicating that richer countries conduct fiscal policy with more discretion than poorer countries. However, as we will see in the next column, it loses its statistical significance. As regards government size, policy volatility would drop by about 3.3 per cent for every percentage point increase in the ratio of primary expenditure to GDP. This confirms the results of Afonso et al. (2008), who demonstrate that bigger governments have more stable government spending and automatic stabilisers are larger, inducing lower volatility of discretionary spending.

Another variable that has been popular in explaining the volatility of fiscal policy is country size (population of a given country). Smaller countries tend to use more discretion in fiscal policy, as documented by Furceri and Poplawski (2008), who argue that the negative relationship between the size of nations and government spending volatility can be explained by two reasons: first, smaller countries, which are more exposed to idiosyncratic shocks and have more output volatility, use fiscal policy more aggressively; second, larger countries have more scope to spread the government spending financing over a larger pool of taxpayers (increasing returns to scale), allowing governments to provide public goods in a less volatile way. Using the same approach as Fatás and Mihov (2003) to build a measure of discretionary fiscal policy, they showed a statistically significant negative impact of country size on policy volatility. Afonso et al. (2008), and Agnello and Sousa (2009) have also found a negative effect of country size on the volatilities of fiscal policy and public deficit, respectively. Our specification of column (4) also evidences a statistically strong negative effect. For example, a country (such as Poland) that has twice the

population of another country (such as Romania) will have 14 per cent less policy volatility, all else being equal. Finally, of the last three dummies, only the run-up to the EMU dummy is significant. Accordingly, the EU-12 countries, which initially adhered to EMU requirements, experienced on average about 30.7 per cent less volatility.

Adding all the variables together does not really improve the quality of the regression (R-squared of 0.421 from 0.375 of the previous specification), suggesting that the political and institutional variables may not be so important to explain different levels of policy volatility between countries (column (5)). Indeed, with the exception of the Herfindahl index, none of these variables are significant. Interestingly, the Delegation index is still highly important: a one standard-deviation increase in this index would lower discretionary policy volatility by approximately 18.2 per cent. Looking at the control variables, with the exception of GDP per capita, all the variables that were significant in column (4) continue to be of crucial importance. For instance, a one percentage point increase in government size would lower policy volatility by 2.8 per cent.

When estimating this type of equation, one econometric problem that may arise and that could compromise our results and interpretations of the coefficients, is the possibility that budget outcomes (volatility of discretionary fiscal policy in our case) influence the evolution of fiscal institutions, rather than the other way around. We are assuming that the causality runs from fiscal institutions (the Delegation index) to fiscal behaviour, but it is possible that these institutions might be simply a reflection of a deep preference of the society for fiscal discipline and stability. The literature has recognised this problem of reverse causality as one of the most complex to solve, as it is extremely difficult to find instruments that are not influenced by the dependent variables and can, at the same time, influence the fiscal institutions. What has been assumed in previous papers is that fiscal policy cannot feed back into modification of fiscal institutions since they are costly to change and it takes a

long time to make any sort of considerable alteration. Notwithstanding, we try to deal with reverse causality, by resorting to a set of instruments for the Delegation index: a dummy for countries with delegation in the execution of the budget; and five Worldwide Governance Indicators (WGI), namely voice and accountability, political stability and absence of violence, government effectiveness, regulatory quality, and control of corruption.[15] We argue that all these variables are not affected by fiscal policy, and have some predictive power in explaining the evolution of the Delegation index. Nevertheless, all the IV estimates that we provide should be interpreted with extreme prudence, as one can argue that our instruments may also suffer from the same problems they propose to solve.

In column (6) we have performed the estimation via 2SLS, i.e. using the IV estimator, where we employ the above mentioned instruments for the Delegation index. The presence of a measurement error in the dependent variable (as it is estimated rather than observed) leads to attenuation bias in the previous columns (OLS estimations), i.e. the coefficients of the IV estimation more than double.[16] Our index for the quality of institutions is still highly significant at better than the 10 per cent level of significance: the point estimates signal a negative impact on the dependent variable of approximately 33 per cent, ceteris paribus. In spite of the fact that the test of overidentifying restrictions (OID) confirms the validity and appropriateness of our instruments, as it does not reject the orthogonality of the instruments and the error terms (the instruments are uncorrelated with the residuals), we have to be prudent when interpreting these IV estimations since this test has low power when the sample size is small. The results could therefore be misleading and we should put more weight in the interpretation of the non-IV estimations.

[15] See the variable definitions in Appendix B and Kaufmann et al. (2009).

[16] Wooldridge (2002, pp. 89) states that OLS regressions may suffer from attenuation bias due to classical errors-in-variables assumption (measurement errors), which would produce lower coefficients compared to IV regressions. He also offers another type of explanation which points to the possibility that the instruments are not entirely exogenous.

4.2 Fiscal rule index

The overall results of Table 2 gave support to the idea that fiscal institutions in the form of tight budgetary procedures matter for the volatility of fiscal policy. For numerical fiscal rules, a negative sign is also expected, as they prevent governments from engaging in large swings in fiscal policy. Our prediction is confirmed in Table 3:[17] in a bivariate regression (column (1)), a one-standard deviation increase in the FRI would cause a decrease in policy volatility by approximately 13.6 per cent.

Going forward, in column (5), the FRI is still highly significant and robust when we consider the political, institutional and macroeconomic controls. On average, it would reduce public spending volatility by around 17.0 per cent for an additional standard deviation in the FRI. The estimate obtained for the GDP per capita coefficient, contrasting to the one obtained in Table 2, has the expected sign and it is significant at the 10 per cent level, signalling that richer countries are associated with lower levels of volatility. In turn, bigger governments and countries continue to be associated with reduced levels of policy volatility.

Considering the exposure of economic sectors to external competitiveness, we expect economies more open to external trade, and therefore more exposed to external shocks, to exert an upward force on policy volatility, as documented by Agnello and Sousa (2009). In fact, this is what is shown by our estimates, although with a small quantitative impact: a one percentage point increase in the degree of openness would lead to an increase of public spending volatility by about 0.3 per cent.

Regarding the last three dummy variables, estimates suggest that all of them are associated with lower levels of policy volatility. The interpretation over the sign of the run-up to EMU and the SGP dummy is consensual as those stages have required significant improvements in public finances, lowering therefore policy volatility. In contrast, the explanation for the new members (CEEC) dummy deserves some fur-

[17] It is worth mentioning that in all tables where we use the FRI, we lose some observations due to the shorter period covered (from 1990 onwards). In addition, comparing to Table 2, Malta is included and Romania is dropped due to lack of data.

ther justification. As has been seen in Figure 1, data for most of the new members are only available for the last decade, conditioning the analysis to only one observation per country. This period of time was marked by major improvements in public finances in order to meet requirements for joining the EU, which led the CEEC to post low values of discretion.[18]

Similarly to the previous table, we account for the possibility of reverse causality running from policy volatility to fiscal rules. The instruments are the same as the ones used before for the Delegation index, except for the Delegation dummy, which is replaced by a dummy that assumes the value of 1 for countries that rule their budget process mainly by commitment over fiscal contracts. This replacement is justified by the fact that countries that privilege delegation have more implicit budgetary procedures, while countries characterized by commitment to fiscal contracts have more numerical fiscal rules shaping the budget process. The IV estimation shows that the FRI is still significant, albeit with lower statistical power.

4.3 Bringing together the implicit and explicit constraints

After analysing the importance of budget procedures, whether implicit or explicit, it might be of interest to check if these results remain valid even after considering both types of restrictions in the same equation. Before turning to the estimates, one may argue that when running regressions with variables that capture the implicit and explicit restrictions on the budget process, collinearity problems might emerge as they can be expected to be highly correlated. The working assumption that we will follow is that these two variables capture different types of restrictions in force in a given country, not being necessarily correlated. Hallerberg et al. (2007) also employ indexes of delegation and rules in the same equation. They state that the nature of restrictions depends on the type of government (one-party governments versus coalitions with high ideological dispersion), so it is not necessarily true that

[18]For instance, Poland (0.7), Slovenia (1.0), Czech Republic (1.1), Romania (1.8) and Lithuania (2.0) are among the seven lowest discretion volatilities.

a higher Delegation index implies a higher Rule index. In our case, for instance, as said before, some countries such as Denmark, Netherlands and Finland are associated with high FRI but low Delegation index. In fact, one country can have more numerical fiscal rules at the expense of less implicit budgetary procedures or vice-versa. This assumption seems to be reasonable, as the simple correlation between these two indexes in our data points to around 0.3 and -0.1 in the 1990s and 2000s, respectively (Appendix C).

Looking at Table 4, we corroborate the previous findings concerning the indexes for the quality of the institutions, which point towards a sizeable negative impact on policy volatility. Throughout all specifications, the marginal impact of the FRI on public spending volatility ranges between -6.9 and -14.1 per cent, whereas the range on the Delegation index runs between -4.5 and -17.7 per cent. Taking the last column with all the control variables, there is a strong indication that countries which stand at a one-standard deviation above the average in both indexes have on average -22.3 per cent less volatility in the discretionary component of fiscal policy. It is a striking result that reinforces our previous estimates: better and more stringent restrictions imposed on the conduct of fiscal policy help mitigate the negative impact of policy volatility on the economy. For instance, if Portugal improved the quality of its institutions, by increasing both indexes (FRI and Delegation index) by one-standard deviation above the average levels, and considering that the average value for the last decade reflects its current policy volatility, it would reduce policy volatility from 2.5 to 1.9 (reaching values close to Spain).

In terms of political controls, we only find statistical evidence for the Herfindahl index. Higher concentration of parliamentary seats in a few political parties appears, thus, to undermine fiscal discipline: for each additional tenth of a point index, the dependent variable would rise by 7.7 per cent. Furthermore, government size and country size are still robust to different specifications, and with the expected sign. Finally, the last three dummies continue to be significant controls for our estimations.

4.4 Sub-categories of the FRI and Delegation index

Having found strong statistical evidence in our indexes for the quality of the institutional environment constraining the policy-making of governments, it is also pertinent to confirm if the results remain valid and robust when we proceed to disaggregate them into sub-categories. Additionally, it would be of interest to find which sub-component, feeding each index, exerts the most influential role in reducing policy volatility.

The indexes that we have focused on so far here can be subdivided into the following sub-indexes: the Delegation index is subdivided into the Preparation, Implementation and Approval stages; for the FRI, we split it into two indexes that capture all the expenditure rules in force in the EU member states, the expenditure rule index (ERI), and the other that deals with budget balance and debt rules (BBDRI).

We begin with Table 5, which displays the specifications of each phase of the Delegation index. The most interesting finding relates to the fact that, among all the stages through which the budget draft is prepared, approved and implemented, only the Approval index seems to have explanatory power for policy volatility in the case where we include all the relevant control variables. In fact, the Preparation index loses statistical significance when we gather all the political, institutional and macroeconomic variables, while the Implementation index is only significant in the first three columns, though without the expected sign.

Against this background, policy-makers should arguably aim for a strong Approval index. That is, firstly, the executive should be vested with strong agenda-setting powers in order to be protected against significant parliamentary amendments to the initial proposal of the budget, which can create excessive volatility in the conduct of fiscal policy; secondly, the possibility that parliament is dissolved if it fails to approve the budget in due time would increase the political costs associated to such a fall of government, which would lead to a more consensus on the initial

budget proposal; and finally, the sequence of votes also matters to reduce policy volatility, i.e. the order of decision-making during the parliamentary budget deliberation should be focused first on defining the limits over total revenue, expenditure and deficit before the work on the details of the budget starts. Looking at the estimates in column (5), its individual effect on the volatility of fiscal policy points to a negative impact of around 15.1 per cent for an additional one-standard deviation increase in the Approval index.[19] Column (5) provides further evidence for a negative relationship between government size and policy volatility, while there is also some support for a destabilising effect on policy volatility of higher concentration of power in the parties.

Moving forward to the sub-categories of the FRI, our overall assessment of columns (1) to (5) of Table 6 is that considering the index of numerical fiscal rules as a whole or taking each sub-component individually leads to qualitatively equal results. Column (5) tells us that a one-standard deviation increase in the ERI and in the BBDRI, other things being equal, would reduce policy volatility by about 11.6 and 14.4 per cent, respectively. From an efficient point of view, estimates suggest that it would be preferable to focus more on budget balance and debt rules, since they appear to have more impact on fiscal policy volatility than expenditure rules. Nevertheless, we cannot reject the hypothesis that the coefficients are statistically equal to each other (at better than the 18 per cent level). As regards other variables, there is strong evidence that bigger governments and countries have lower levels of policy volatility, and there is also some evidence that richer countries experience less police volatility, although with low statistical power. Again, the last three dummies continue to be highly significant.

[19]However, this does not mean that the preparation and implementation stages should be left out from the design of an optimal institutional framework for fiscal policy. In fact, the three variables could be highly correlated between them, and the Approval index may be capturing the effects of the other two indexes on policy volatility, which ultimately would produce misleading results. However, we have tested if there is any statistical significant correlation between each one of these three variables, and the results only pointed to a significant correlation between the Preparation index and Approval index of about 0.6.

In the last two columns, we employ for the two indexes individually, the same instruments used before for the FRI and we estimate the equation via 2SLS. The results suggest no statistical effect of the ERI and the BBDRI on the dependent variable. However, as we have highlighted before, the estimations by IV should be considered more as an attempt to resolve the reverse causality problem running from policy volatility to rules, which is subject to many challenges not yet solved by economists.

Finally, Table 7 focuses the analysis on all the previous five sub-indexes to check if the prior results remain valid. Adding up those indexes does not affect the overall results of previous tables. In fact, we find that the coefficients and the statistical significance of the ERI and the BBDRI, and of the Approval index, are broadly unchanged. The BBDRI is persistently associated with lower levels of policy volatility, while the ERI becomes significant when we include the macroeconomic variables. In turn, the Approval index is also highly statistically significant to help attain low levels of policy volatility, but with the advantage of being robust throughout all the specifications. Furthermore, government size loses significance in the last column, at the expense of GDP per capita. The last three dummies also contribute to lower policy volatility.

5 Robustness results

In this section, we conduct some robustness analysis to check if the remarks inferred from our baseline estimates could be extended in two ways, whether by using a different measure of public spending in Equation (1) or by using another specification for the fiscal reaction function to derive our measure of discretionary fiscal policy volatility.

We start this analysis by employing a different variable to serve as a proxy for public spending. In this context, real primary expenditure in Equation (1) is

replaced by real consumption expenditure. We want to test if a narrower measure of fiscal policy, which has been widely used by most of the papers when using a large sample of countries, does still corroborate our findings. Afterwards, we re-estimate different specifications of columns (5) of previous tables (from Table 2 to Table 7).

Overall, the results seem a little disappointing as the indexes for the quality of the institutions suggest that they have no statistical effect on policy volatility (Table 8). This can be associated with the fact that we are dealing with a less comprehensive measure of fiscal policy, leaving out important items of government expenditure, such as gross capital formation, subsidies and social benefits other than transfers in kind, other current transfers and capital transfers, which cannot capture all discretionary measures undertaken by governments. As we have shown before in Table 1, the results we get depend, to a large extent, on the measure used for public spending. For instance, Spearman's rank order correlation between primary expenditure (our baseline measure for public spending, which corresponds to Discretion 1) and consumption expenditure (Discretion 2) begins with 0.80 in the 1980s, and then decreases to 0.38 and 0.34 in subsequent decades (though the latter are not statistically significant).

It is worth mentioning that government size continues to be highly significant and with the expected sign. There is also some support for lower policy volatility in bigger countries, whereas inflation and the number of elections become significant for the first time, throughout all specifications, pointing to increased policy volatility in the presence of elections and of high inflation.

We now turn to Equation (2), where we estimate a typical reaction function for the CAPE, which reacts to the output gap, past developments in public debt and to its own past values. After that, and similarly to what was done in Equation (1), we take the logarithm of the standard deviation of the residuals as our measure of the volatility of discretionary fiscal policy.

Contrary to what was shown before (Table 2), Table 9 displays no significant

impact of the Delegation index on policy volatility, once we include all the relevant control variables.[20] In contrast, column (2) and (3) exhibit strong negative effects of the FRI on policy volatility, giving robustness to our previous findings. The last two columns in the sub-categories of the FRI also support the relevant role played by the ERI and the BBDRI in reducing policy volatility. In column (6), all the coefficients of the sub-components of the Delegation index become very powerful in explaining differences in fiscal policy volatility, though with some odd results. In fact, this estimate yields unexplained results, as the Approval and the Implementation indexes appear to induce higher volatility, while only the Preparation stage has the expected (negative) sign. Once again, we refer the reader to Table 1 in order to try to understand how it is possible to get such kind of disparity among estimates. According to the correlations between primary expenditure (Discretion 1) and CAPE (Discretion 3), they are only statistically different from zero in the last decade (correlation of 0.82).

A result that deserves further analysis relates to the coefficients of government size. In contrast to what has been observed in the generality of previous estimations, where big governments have been associated with less policy volatility since they seek to fundamentally smooth the adverse effects of shocks, the size of government loses its significance when we use the specification of Table 9 (except in column (6), but with the wrong sign). A possible explanation is that, in this estimation, the residuals were obtained from an equation where primary spending was cyclically adjusted, that is, by construction, the reaction to shocks through automatic stabilisers was removed. In this context, bigger governments no longer mean less policy volatility.

As a final point, Table 10 summarises the results for the case where we use the ratio of consumption expenditure to potential GDP, instead of the CAPE, as the proxy for public spending in Equation (2). In general, this table confirms some of the results of the previous table. For instance, there is no explanatory power of

[20]However, it is very close to the relevant thresholds of significance (it is significant at the 12 per cent level).

the Delegation index, while the FRI continues to have statistical power to reduce policy volatility. Regarding the sub-indexes of both main indexes, we find some differences with the previous table, where the ERI and all the sub-components of the Delegation index are never significant.

6 Concluding Remarks

This work provides evidence for a sizeable, statistically significant negative impact of the quality of institutions on public spending volatility in the EU countries. It is probably the case that countries with more checks and balances make it more difficult for governments to change fiscal policy for reasons unrelated to the current state of the economy. Considering our baseline specification for public spending (primary expenditure), we show that numerical fiscal rules in force in EU countries are statistically significant to reduce the volatility of discretionary fiscal policy. We also show that increased values of the Delegation index, which captures the implicit procedures governing the budget process, can help attain lower policy volatility. However, of the three phases of the budget process, only the Approval stage, in which the budget draft is reviewed, approved and then formalised, appears to have statistical power to explain cross-country differences in policy volatility. Including all the relevant control variables, countries that stand a one-standard deviation above the average in both the FRI and Delegation index have on average -22.3 per cent less volatility in the discretionary component of fiscal policy. This finding reinforces the need for a well-defined and appropriate institutional design of fiscal rules and of budgetary procedures, since it helps to promote low levels of public spending volatility.

Our results confirm the findings of Furceri and Poplawski (2008), who state that bigger countries have on general less government spending volatility, as they resort less to government spending for fine-tuning purposes and as governments from big countries could provide public goods in a less volatile way. Our estimates provide further evidence about the stabilising function that bigger governments exert, since countries with large public sectors as a percentage of GDP have more stable government spending and automatic stabilisers are larger, inducing lower volatility of discretionary spending.

What appears to be a surprise, and in fact contrasts with results elsewhere, re-

lates to the insignificance of most of the political factors. In fact, with the exception of the Herfindahl index which suggests that high concentration of parliamentary seats in a few parties would increase public spending volatility, none of the political variables turn out to be statistically significant. For instance, we do not find a political budget cycle played by the existence of elections in a given year, as documented by several authors. However, if one takes into account that we are dealing with the EU countries that have more political similarities than one would initially suspect, then the results in relation to the political variables are less surprising.

In general, the run-up to EMU and the SGP dummies have the expected sign, which points to lower levels of policy volatility. For most of the new EU members, where we have only one decade of data available, the results generally point to reduced levels of policy volatility, reflecting recent improvements towards sounder public finances in order to meet the requirements for joining the EU.

Notwithstanding, our analysis is somewhat conditioned by the choice on the measure used for public spending. For instance, if we chose public consumption instead of primary expenditure (used in the baseline), none of the variables measuring the quality of institutions would be significant. Nevertheless, this is an interesting result as it can shed some light on the possible weaknesses of previous studies (Fatás and Mihov (2003), and Afonso et al. (2008)), where public consumption has been used as the measure of public spending. In fact, by relying on a less comprehensive measure of fiscal policy, these previous studies have left out important items of government expenditure (such as gross capital formation, subsidies and social benefits other than transfers in kind, other current transfers and capital transfers), which cannot capture all discretionary measures undertaken by governments and ultimately can lead to misleading results. Using a typical fiscal reaction function with the CAPE or the ratio of consumption expenditure to GDP as proxies of public spending would produce similar results as the baseline ones for the fiscal rules variables. Nonetheless, we would not be able to reject the hypothesis of the insignificance of the implicit

procedures and rules governing the budget process to determine the volatility of public spending.

All in all, by studying the effects of explicit and implicit budgetary constraints on fiscal policy volatility, we contribute to the debate on improving and reaching an optimal institutional framework for fiscal policy. Although our results point to the strengthening of fiscal institutions, each case must be considered individually, taking into account the prevailing institutional and economic environment, and evaluating the advantages and disadvantages of the application of given constraints. In fact, there are some countries that are more exposed and vulnerable to external shocks and therefore it would be preferable to have more flexibility to respond to these shocks, minimising in that way the economic costs of restrictions and deliberately letting the volatility increase.

The current analysis also offers several possibilities for further research. After studying the impacts of restrictions on policy volatility, one could test, following Fatás and Mihov (2006), if the impacts of the imposition of tight restrictions that reduce policy volatility, and thus output volatility as well, would in fact outweigh the negative effects of the loss of flexibility to respond to output shocks. Another possible extension, in line with Fabrizio and Mody (2008), would be to identify what determines the existing institutional environment in force in EU countries.

Appendix

A Tables

- Baseline results: Tables 2-7
- Robustness results: Tables 8-10

Table 2: Delegation index and discretionary fiscal policy
Dependent variable: volatility of discretionary fiscal policy

	(1)	(2)	(3)	(4)	(5)	(6) IV
Delegation index	-0.133**	-0.036***	-0.154**	-0.202***	-0.201***	-0.401*
	(0.054)	(0.010)	(0.070)	(0.047)	(0.059)	(0.236)
Electoral system		0.665***			0.163	-0.222
		(0.172)			(0.243)	(0.524)
Elections		-0.793			0.218	-0.914
		(0.953)			(1.483)	(1.381)
Herfindahl index		2.045**			1.711*	0.996
		(0.983)			(1.034)	(1.407)
Elec. competitiveness		0.030			0.050	0.054
		(0.052)			(0.046)	(0.074)
Government crises			-0.151		-0.188	-0.092
			(0.285)		(0.332)	(0.295)
Cabinet changes			-0.203		-0.022	-0.042
			(0.369)		(0.481)	(0.490)
GDP per capita				0.375*	0.416	-0.022
				(0.202)	(0.317)	(0.560)
Government size				-0.034***	-0.028***	-0.031
				(0.006)	(0.008)	(0.019)
Country size				-0.138***	-0.129***	-0.198**
				(0.042)	(0.028)	(0.078)
Dependency ratio				0.026***	0.021*	0.010
				(0.004)	(0.012)	(0.039)
Openness				-0.002	0.000	-0.001
				(0.002)	(0.002)	(0.005)
Inflation				0.004	0.008	0.005
				(0.022)	(0.025)	(0.013)
Run-up to EMU				-0.367***	-0.375***	-1.229**
				(0.093)	(0.140)	(0.506)
SGP dummy				-0.127	-0.181	-0.287
				(0.082)	(0.156)	(0.270)
New members				-0.209	-0.203	-0.873
				(0.135)	(0.143)	(0.596)
Number of observations	57	57	57	57	57	42
Number of countries	24	24	24	24	24	24
R-squared	0.064	0.178	0.083	0.375	0.421	0.412
OID test (p-value)						0.206

Notes: OLS estimates with panel-corrected standard errors taking 10-year averages. Standard errors are shown in parentheses. Asterisks, *, **, ***, denote, respectively, statistical significance at the 10, 5 and 1% level. Constant terms are not reported. Policy volatility was obtained from the logarithm of the standard deviation of residuals of Equation (1), with the growth of real primary expenditure as dependent variable. In column 6, the Delegation index was instrumented by: delegation dummy and five Worldwide Governance Indicators (see Appendix B). The overidentifying restrictions test (OID) or Sargan test reports p-value from a test that the instruments are uncorrelated with the residuals.

Table 3: Fiscal rule index and discretionary fiscal policy
Dependent variable: volatility of discretionary fiscal policy

	(1)	(2)	(3)	(4)	(5)	(6) IV
Fiscal rule index	-0.146***	-0.088***	-0.166***	-0.212***	-0.186***	-0.358*
	(0.026)	(0.028)	(0.028)	(0.020)	(0.040)	(0.210)
Electoral system		0.540***			0.466	0.441
		(0.149)			(0.379)	(0.341)
Elections		-1.422			-1.420	-1.214
		(0.997)			(1.144)	(1.436)
Herfindahl index		0.869			0.420	-0.760
		(0.685)			(0.297)	(1.756)
Elec. competitiveness		-0.002			0.016	-0.024
		(0.038)			(0.034)	(0.092)
Government crises			-0.119		-0.160	-0.271
			(0.213)		(0.358)	(0.322)
Cabinet changes			-0.403		-0.014	0.029
			(0.329)		(0.623)	(0.488)
GDP per capita				-0.454***	-0.409*	-0.103
				(0.171)	(0.244)	(0.539)
Government size				-0.022***	-0.020**	-0.028*
				(0.008)	(0.009)	(0.016)
Country size				-0.137***	-0.079*	-0.029
				(0.025)	(0.044)	(0.097)
Dependency ratio				-0.040*	-0.025	-0.022
				(0.021)	(0.027)	(0.034)
Openness				0.003**	0.003**	0.002
				(0.001)	(0.001)	(0.004)
Inflation				-0.004	0.002	0.002
				(0.024)	(0.021)	(0.013)
Run-up to EMU				-1.738***	-1.724***	-1.987***
				(0.095)	(0.041)	(0.607)
SGP dummy				-0.550***	-0.598***	-0.750**
				(0.139)	(0.130)	(0.323)
New members				-1.528***	-1.431***	-1.374***
				(0.079)	(0.121)	(0.518)
Number of observations	42	42	42	42	42	42
Number of countries	24	24	24	24	24	24
R-squared	0.066	0.158	0.101	0.388	0.430	0.397
OID test (p-value)						0.319

Notes: OLS estimates with panel-corrected standard errors taking 10-year averages. Standard errors are shown in parentheses. Asterisks, *, **, ***, denote, respectively, statistical significance at the 10, 5 and 1% level. Constant terms are not reported. Policy volatility was obtained from the logarithm of the standard deviation of residuals of Equation (1), with the growth of real primary expenditure as dependent variable. In column 6, the Fiscal rule index was instrumented by: commitment dummy and five Worldwide Governance Indicators (see Appendix B). The overidentifying restrictions test (OID) or Sargan test reports p-value from a test that the instruments are uncorrelated with the residuals.

Table 4: Delegation and Fiscal rule indexes and discretionary fiscal policy
Dependent variable: volatility of discretionary fiscal policy

	(1)	(2)	(3)	(4)	(5)
Fiscal rule index	-0.105***	-0.072***	-0.134***	-0.152***	-0.119***
	(0.025)	(0.023)	(0.021)	(0.021)	(0.016)
Delegation index	-0.093*	-0.046*	-0.084	-0.195***	-0.117***
	(0.051)	(0.026)	(0.068)	(0.025)	(0.062)
Electoral system		0.513***			0.174
		(0.139)			(0.269)
Elections		-1.738			-1.305
		(1.129)			(1.494)
Herfindahl index		1.077			0.739***
		(0.679)			(0.168)
Elec. competitiveness		-0.002			0.034
		(0.033)			(0.038)
Government crises			-0.155		-0.142
			(0.248)		(0.408)
Cabinet changes			-0.354		-0.039
			(0.412)		(0.639)
GDP per capita				-0.064	-0.220
				(0.256)	(0.396)
Government size				-0.032***	-0.025***
				(0.009)	(0.009)
Country size				-0.138***	-0.131***
				(0.035)	(0.038)
Dependency ratio				-0.004	-0.010
				(0.008)	(0.019)
Openness				0.000	0.001
				(0.002)	(0.001)
Inflation				-0.001	0.004
				(0.026)	(0.023)
Run-up to EMU				-1.507***	-1.538***
				(0.113)	(0.059)
SGP dummy				-0.470***	-0.477***
				(0.131)	(0.109)
New members				-1.083***	-1.170***
				(0.154)	(0.096)
Number of observations	41	41	41	41	41
Number of countries	23	23	23	23	23
R-squared	0.084	0.165	0.113	0.439	0.462

Notes: OLS estimates with panel-corrected standard errors taking 10-year averages. Standard errors are shown in parentheses. Asterisks, *, **, ***, denote, respectively, statistical significance at the 10, 5 and 1% level. Constant terms are not reported. Policy volatility was obtained from the logarithm of the standard deviation of residuals of Equation (1), with the growth of real primary expenditure as dependent variable.

Table 5: Sub-categories of Delegation index and discretionary fiscal policy
Dependent variable: volatility of discretionary fiscal policy

	(1)	(2)	(3)	(4)	(5)
Preparation index	-0.134*	-0.114	-0.134*	-0.099*	-0.111
	(0.077)	(0.07)	(0.076)	(0.059)	(0.083)
Approval index	-0.125***	-0.065	-0.140***	-0.154**	-0.164**
	(0.046)	(0.060)	(0.043)	(0.068)	(0.077)
Implementation index	0.110***	0.108***	0.098***	-0.021	-0.032
	(0.021)	(0.024)	(0.030)	(0.043)	(0.077)
Electoral system		0.405*			0.031
		(0.215)			(0.285)
Elections		-0.326			0.648
		(0.704)			(1.475)
Herfindahl index		1.604**			1.457*
		(0.794)			(0.788)
Elec. competitiveness		0.018			0.033
		(0.041)			(0.057)
Government crises			-0.122		-0.241
			(0.166)		(0.261)
Cabinet changes			-0.208		0.056
			(0.308)		(0.424)
GDP per capita				0.372**	0.449
				(0.189)	(0.326)
Government size				-0.030***	-0.026***
				(0.006)	(0.007)
Country size				-0.093	-0.090
				(0.076)	(0.066)
Dependency ratio				0.023***	0.016
				(0.004)	(0.018)
Openness				-0.001	0.001
				(0.002)	(0.004)
Inflation				0.003	0.007
				(0.022)	(0.023)
Run-up to EMU				-0.388***	-0.400***
				(0.103)	(0.139)
SGP dummy				-0.109	-0.174
				(0.072)	(0.141)
New members				-0.220*	-0.238
				(0.131)	(0.154)
Number of observations	57	57	57	57	57
Number of countries	24	24	24	24	24
R-squared	0.204	0.258	0.221	0.397	0.439

Notes: OLS estimates with panel-corrected standard errors taking 10-year averages. Standard errors are shown in parentheses. Asterisks, *, **, ***, denote, respectively, statistical significance at the 10, 5 and 1% level. Constant terms are not reported. Policy volatility was obtained from the logarithm of the standard deviation of residuals of Equation (1), with the growth of real primary expenditure as dependent variable.

Table 6: Sub-categories of Fiscal rule index and discretionary fiscal policy

Dependent variable: volatility of discretionary fiscal policy

	(1)	(2)	(3)	(4)	(5)	(6) IV	(7) IV
Expenditure rule index	-0.065*	-0.047*	-0.104**	-0.097**	-0.123***	-0.353	
	(0.036)	(0.025)	(0.043)	(0.039)	(0.011)	(0.224)	
B.B. and debt rules index	-0.118***	-0.075***	-0.122***	-0.165***	-0.155***		-0.228
	(0.020)	(0.015)	(0.031)	(0.033)	(0.020)		(0.206)
Electoral system		0.540***			0.526	0.716*	0.427
		(0.148)			(0.350)	(0.401)	(0.346)
Elections		-1.489			-1.661	-2.041	-1.466
		(0.998)			(1.073)	(1.584)	(1.429)
Herfindahl index		0.832			0.216	0.686	0.036
		(0.740)			(0.533)	(1.289)	(1.805)
Elec. competit.		-0.006			0.011	0.092	-0.028
		(0.037)			(0.039)	(0.089)	(0.110)
Government crises			-0.121		-0.187	-0.234	-0.156
			(0.212)		(0.338)	(0.346)	(0.312)
Cabinet changes			-0.464		-0.065	-0.159	-0.016
			(0.421)		(0.637)	(0.540)	(0.489)
GDP per capita				-0.462**	-0.355*	-0.260	-0.420
				(0.221)	(0.206)	(0.527)	(0.486)
Government size				-0.022***	-0.020**	-0.004	-0.028
				(0.007)	(0.009)	(0.016)	(0.019)
Country size				-0.140***	-0.063**	-0.035	-0.081
				(0.032)	(0.030)	(0.104)	(0.089)
Dependency ratio				-0.038**	-0.022	-0.034	-0.015
				(0.016)	(0.025)	(0.038)	(0.036)
Openness				0.003	0.002	0.004	0.001
				(0.002)	(0.001)	(0.004)	(0.004)
Inflation				-0.005	0.003	0.015	-0.003
				(0.024)	(0.021)	(0.016)	(0.013)
Run-up to EMU				-1.724***	-1.768***	-1.833***	-1.721***
				(0.076)	(0.034)	(0.622)	(0.576)
SGP dummy				-0.540***	-0.618***	-0.630**	-0.604**
				(0.128)	(0.108)	(0.318)	(0.307)
New members				-1.502***	-1.400***	-1.596***	-1.304**
				(0.100)	(0.067)	(0.571)	(0.543)
No. Observations	42	42	42	42	42	42	42
No. Countries	24	24	24	24	24	24	24
R-squared	0.063	0.161	0.104	0.381	0.437	0.263	0.391
OID test (p-value)						0.453	0.187

Notes: OLS estimates with panel-corrected standard errors taking 10-year averages. Standard errors are shown in parentheses. Asterisks, *, **, ***, denote, respectively, statistical significance at the 10, 5 and 1% level. Constant terms are not reported. Policy volatility was obtained from the logarithm of the standard deviation of residuals of Equation (1), with the growth of real primary expenditure as dependent variable. In columns 6 and 7, the ERI and BBDRI were instrumented by the same variables used in Table 3. The overidentifying restrictions test (OID) or Sargan test reports p-value from a test that the instruments are uncorrelated with the residuals.

Table 7: Sub-indexes and discretionary fiscal policy
Dependent variable: volatility of discretionary fiscal policy

	(1)	(2)	(3)	(4)	(5)
Expenditure rule index	-0.011	0.013	-0.053	-0.088**	-0.097***
	(0.036)	(0.048)	(0.060)	(0.043)	(0.036)
B.B. and debt rules index	-0.081***	-0.058	-0.099***	-0.139***	-0.133**
	(0.025)	(0.065)	(0.030)	(0.043)	(0.058)
Preparation index	-0.104	-0.092	-0.092	-0.162	-0.170
	(0.120)	(0.169)	(0.114)	(0.113)	(0.161)
Approval index	-0.128***	-0.129***	-0.128***	-0.144***	-0.152***
	(0.020)	(0.019)	(0.021)	(0.051)	(0.024)
Implementation index	0.083**	0.076***	0.089*	0.078	0.090
	(0.039)	(0.028)	(0.047)	(0.059)	(0.071)
Electoral system		0.251			0.049
		(0.222)			(0.315)
Elections		-1.543			-1.357
		(1.274)			(1.226)
Herfindahl index		1.141*			0.301
		(0.664)			(0.348)
Elec. competitiveness		-0.007			0.021
		(0.023)			(0.053)
Government crises			-0.166		-0.297
			(0.158)		(0.269)
Cabinet changes			-0.414		0.094
			(0.447)		(0.677)
GDP per capita				-0.222	-0.302***
				(0.162)	(0.064)
Government size				-0.023***	-0.018
				(0.009)	(0.013)
Country size				-0.051	-0.027
				(0.058)	(0.045)
Dependency ratio				-0.029	-0.043
				(0.028)	(0.057)
Openness				0.003	0.004
				(0.002)	(0.003)
Inflation				-0.002	0.004
				(0.025)	(0.026)
Run-up to EMU				-1.911***	-2.030***
				(0.292)	(0.446)
SGP dummy				-0.559***	-0.616***
				(0.165)	(0.213)
New members				-1.430***	-1.595***
				(0.278)	(0.559)
Number of observations	41	41	41	41	41
Number of countries	23	23	23	23	23
R-squared	0.168	0.229	0.203	0.490	0.521

Notes: OLS estimates with panel-corrected standard errors taking 10-year averages. Standard errors are shown in parentheses. Asterisks, *, **, ***, denote, respectively, statistical significance at the 10, 5 and 1% level. Constant terms are not reported. Policy volatility was obtained from the logarithm of the standard deviation of residuals of Equation (1), with the growth of real primary expenditure as dependent variable.

Table 8: Consumption expenditure and discretionary fiscal policy

Dependent variable: volatility of discretionary fiscal policy

	(1)	(2)	(3)	(4)	(5)	(6)
Fiscal rule index		-0.194	-0.144			
		(0.291)	(0.213)			
Expenditure rules index					0.075	0.102
					(0.185)	(0.117)
B.B. and debt rules index					-0.235	-0.214
					(0.261)	(0.135)
Delegation index	-0.096		-0.096			
	(0.121)		(0.213)			
Preparation index				-0.076		-0.041
				(0.239)		(0.237)
Approval index				-0.094		-0.061
				(0.114)		(0.073)
Implementation index				0.009		0.005
				(0.070)		(0.124)
Electoral system	-0.026	0.050	-0.102	-0.157	-0.031	-0.189
	(0.254)	(0.432)	(0.313)	(0.194)	(0.55)	(0.213)
Elections	3.115***	5.471***	5.416***	3.522***	5.370***	5.342***
	(0.740)	(0.420)	(0.428)	(0.742)	(0.437)	(0.914)
Herfindahl index	1.152*	-0.923	-0.433	0.937	-1.017	-0.452
	(0.638)	(1.860)	(1.927)	(0.660)	(2.198)	(1.978)
Elec. competitiveness	-0.001	-0.030	-0.017	-0.012	-0.081	-0.076
	(0.048)	(0.154)	(0.134)	(0.044)	(0.167)	(0.104)
Government crises	0.227	0.227*	0.272***	0.186	0.238**	0.264***
	(0.180)	(0.130)	(0.090)	(0.216)	(0.112)	(0.045)
Cabinet changes	0.087	-0.522**	-0.565*	0.139	-0.433**	-0.451***
	(0.221)	(0.251)	(0.290)	(0.246)	(0.174)	(0.112)
GDP per capita	-0.055	-0.250	-0.169	-0.027	-0.345	-0.317
	(0.365)	(1.210)	(1.493)	(0.356)	(1.300)	(1.276)
Government size	-0.019*	-0.037***	-0.038***	-0.017*	-0.046***	-0.044**
	(0.010)	(0.008)	(0.014)	(0.010)	(0.013)	(0.021)
Country size	-0.237***	-0.164	-0.210**	-0.209***	-0.185	-0.209*
	(0.071)	(0.129)	(0.089)	(0.079)	(0.164)	(0.109)
Dependency ratio	0.003	0.058	0.067	-0.002	0.065	0.065
	(0.021)	(0.052)	(0.076)	(0.015)	(0.080)	(0.084)
Openness	-0.004	-0.007*	-0.008	-0.003	-0.008	-0.008
	(0.003)	(0.004)	(0.006)	(0.003)	(0.006)	(0.008)
Inflation	0.048***	0.041***	0.042***	0.046***	0.037***	0.035***
	(0.004)	(0.005)	(0.004)	(0.003)	(0.007)	(0.005)
Run-up to EMU	0.896***	0.368	0.497	0.873***	0.441*	0.476
	(0.086)	(0.227)	(0.434)	(0.146)	(0.233)	(0.348)
SGP dummy	0.392**	0.328	0.406***	0.407***	0.337	0.379***
	(0.160)	(0.238)	(0.147)	(0.109)	(0.231)	(0.136)
New members	0.453	0.319	0.475	0.432	0.420	0.485
	(0.330)	(1.018)	(1.327)	(0.335)	(1.247)	(1.286)
Number of observations	60	45	44	60	45	44
Number of countries	24	24	23	24	24	23
R-squared	0.667	0.719	0.721	0.671	0.738	0.740

Notes: OLS estimates with panel-corrected standard errors taking 10-year averages. Standard errors are shown in parentheses. Asterisks, *, **, ***, denote, respectively, statistical significance at the 10, 5 and 1% level. Constant terms are not reported. Policy volatility was obtained from the logarithm of the standard deviation of residuals of Equation (1), with the growth of real consumption expenditure as dependent variable.

Table 9: CAPE and discretionary fiscal policy

Dependent variable: volatility of discretionary fiscal policy

	(1)	(2)	(3)	(4)	(5)	(6)
Fiscal rule index		-0.174**	-0.168***			
		(0.086)	(0.054)			
Expenditure rules index					-0.094***	-0.110***
					(0.035)	(0.006)
B.B. and debt rules index					-0.127	-0.071***
					(0.087)	(0.020)
Delegation index	-0.078		0.071			
	(0.050)		(0.076)			
Preparation index				-0.188		-0.333**
				(0.118)		(0.144)
Approval index				-0.029		0.101***
				(0.049)		(0.027)
Implementation index				0.090		0.366***
				(0.090)		(0.062)
Electoral system	0.096	0.226	0.343	-0.087	0.274	0.105
	(0.282)	(0.307)	(0.415)	(0.272)	(0.258)	(0.386)
Elections	0.789	0.270	0.138	1.529	0.049	0.243
	(1.751)	(2.396)	(2.046)	(1.524)	(2.301)	(1.247)
Herfindahl index	0.917	-0.700	-0.084	0.625	-0.703	0.296
	(1.434)	(0.495)	(0.119)	(1.035)	(0.698)	(0.208)
Elec. competitiveness	-0.034	-0.049	-0.048	-0.044	-0.047	0.023
	(0.046)	(0.129)	(0.120)	(0.050)	(0.141)	(0.055)
Government crises	-0.074	-0.214	-0.172	-0.130	-0.215	-0.264***
	(0.362)	(0.383)	(0.358)	(0.252)	(0.351)	(0.066)
Cabinet changes	-0.006	-0.113	-0.189	0.102	-0.171	-0.221
	(0.499)	(0.417)	(0.420)	(0.395)	(0.415)	(0.350)
GDP per capita	-0.134	-0.221	-0.389	-0.088	-0.217	-0.969***
	(0.265)	(0.601)	(0.595)	(0.232)	(0.656)	(0.245)
Government size	0.003	-0.000	0.006	0.006	0.001	0.034***
	(0.014)	(0.021)	(0.022)	(0.011)	(0.023)	(0.009)
Country size	-0.100***	-0.027***	-0.041	-0.049	-0.021	0.064**
	(0.022)	(0.007)	(0.026)	(0.044)	(0.023)	(0.027)
Dependency ratio	0.032***	0.009	0.004	0.016	0.012	-0.074***
	(0.005)	(0.020)	(0.017)	(0.010)	(0.029)	(0.022)
Openness	0.003	0.003***	0.004***	0.004	0.002***	0.009***
	(0.004)	(0.001)	(0.000)	(0.004)	(0.000)	(0.002)
Inflation	-0.002	0.027	0.027	-0.005	0.031	0.056***
	(0.016)	(0.031)	(0.052)	(0.013)	(0.031)	(0.008)
Run-up to EMU	-0.206***	-0.948***	-0.953***	-0.285***	-0.935**	-1.878***
	(0.056)	(0.349)	(0.351)	(0.062)	(0.411)	(0.253)
SGP dummy	0.213	-0.043	-0.046	0.242**	-0.030	-0.108
	(0.151)	(0.096)	(0.078)	(0.114)	(0.096)	(0.159)
New members	0.211*	-0.265	-0.338	0.145	-0.234	-1.358***
	(0.121)	(0.400)	(0.408)	(0.123)	(0.502)	(0.222)
Number of observations	54	39	38	54	39	38
Number of countries	24	24	23	24	24	23
R-squared	0.364	0.332	0.342	0.446	0.326	0.614

Notes: OLS estimates with panel-corrected standard errors taking 10-year averages. Standard errors are shown in parentheses. Asterisks, *, **, ***, denote, respectively, statistical significance at the 10, 5 and 1% level. Constant terms are not reported. Policy volatility was obtained from the logarithm of the standard deviation of residuals of Equation (2), with the ratio of CAPE to potential GDP as dependent variable.

Table 10: Ratio of consumption expenditure and discretionary fiscal policy

Dependent variable: volatility of discretionary fiscal policy

	(1)	(2)	(3)	(4)	(5)	(6)
Fiscal rule index		-0.191**	-0.129**			
		(0.076)	(0.062)			
Expenditure rules index					-0.060	-0.006
					(0.069)	(0.070)
B.B. and debt rules index					-0.203**	-0.194**
					(0.101)	(0.080)
Delegation index	0.041		0.026			
	(0.026)		(0.020)			
Preparation index				0.023		0.059
				(0.058)		(0.052)
Approval index				0.056		0.002
				(0.036)		(0.043)
Implementation index				-0.026*		0.005
				(0.015)		(0.007)
Electoral system	0.248	0.111	0.212	0.311	0.136	0.253
	(0.233)	(0.326)	(0.297)	(0.236)	(0.327)	(0.348)
Elections	0.118	0.834	0.223	-0.134	0.600	0.029
	(0.355)	(1.314)	(1.478)	(0.419)	(1.267)	(1.178)
Herfindahl index	1.719***	-1.687***	0.806	1.865***	-1.987**	0.432
	(0.181)	(0.630)	(0.889)	(0.125)	(0.977)	(1.320)
Elec. competitiveness	0.007	-0.046	-0.033	0.020	-0.075	-0.086
	(0.098)	(0.123)	(0.100)	(0.091)	(0.145)	(0.115)
Government crises	-0.014	-0.128	-0.002	0.015	-0.145	-0.024
	(0.032)	(0.236)	(0.193)	(0.054)	(0.248)	(0.254)
Cabinet changes	0.205	0.049	-0.072	0.160	0.058	-0.009
	(0.249)	(0.234)	(0.429)	(0.227)	(0.160)	(0.360)
GDP per capita	-0.207	0.079	-0.254	-0.220*	0.111	-0.189
	(0.128)	(0.327)	(0.376)	(0.126)	(0.450)	(0.535)
Government size	0.013***	-0.005	0.009	0.012**	-0.010*	-0.000
	(0.004)	(0.007)	(0.006)	(0.005)	(0.005)	(0.006)
Country size	-0.183***	-0.088***	-0.192***	-0.207***	-0.078**	-0.187**
	(0.011)	(0.022)	(0.054)	(0.017)	(0.031)	(0.078)
Dependency ratio	-0.009	0.004	-0.001	-0.006	0.009	0.009
	(0.016)	(0.019)	(0.026)	(0.018)	(0.007)	(0.021)
Openness	0.003*	-0.002	0.000	0.002*	-0.003*	-0.001
	(0.002)	(0.002)	(0.003)	(0.001)	(0.002)	(0.002)
Inflation	0.050**	0.085	0.044	0.049**	0.074	0.023
	(0.024)	(0.059)	(0.041)	(0.021)	(0.053)	(0.031)
Run-up to EMU	0.787***	0.188	0.268*	0.789***	0.152	0.275*
	(0.178)	(0.182)	(0.159)	(0.154)	(0.197)	(0.146)
SGP dummy	0.222	0.064	0.095	0.219	0.026	0.022
	(0.162)	(0.202)	(0.228)	(0.168)	(0.207)	(0.242)
New members	0.006	-0.196	-0.189	0.034	-0.124	-0.053
	(0.137)	(0.131)	(0.282)	(0.133)	(0.103)	(0.286)
Number of observations	54	39	38	54	39	38
Number of countries	24	24	23	24	24	23
R-squared	0.495	0.44	0.531	0.502	0.460	0.571

Notes: OLS estimates with panel-corrected standard errors taking 10-year averages. Standard errors are shown in parentheses. *, **, ***, denote, respectively, statistical significance at the 10, 5 and 1% level. Constant terms are not reported. Policy volatility was obtained from the logarithm of the standard deviation of residuals of Equation (2), with the ratio of consumption expenditure to potential GDP as dependent variable.

B Variable definitions

Country-specific regressions - Equations (1) and (2)

Data series used in the country-specific regressions (Equations (1) and ((2)) are from the AMECO database, Spring 2009 vintage. The variables were converted into constant prices using GDP deflator. We computed the measure of discretionary fiscal policy volatility for each country and decade for which we have at least five observations per decade. The variables used are:

Real primary government expenditure (Equation (1)): Total expenditure excluding interest in national currency units. Original linked series: *UUTGI* and *UUTGIF*.

Real consumption expenditure (Equation (1)): Final consumption expenditure of general government in local currency units. Original linked series: *UCTGO* and *UCTGOF*.

Cyclically adjusted primary expenditure (Equation (2)): Primary expenditure excluding interest adjusted for the cyclical component as percentage of potential GDP. Original linked series: *UUTGBP* and *UUTGBFP*.

Ratio of consumption expenditure (Equation (2)): Final consumption expenditure as percentage of potential GDP. Original linked series: *UCTGO* and *UCTGOF*.

GDP (Equation (1)): Real gross domestic product. Original series: *UVGD*.

Output gap (Equation (2)): Gap between actual and potential GDP as percentage of potential GDP. Original series: *AVGDGP*.

Public debt (Equation (2)): General government consolidated gross debt as percentage of potential GDP. Original linked series: *UDGGL*.

Inflation (Equation (1)): The proxy for inflation is calculated as the first difference in the logarithm of GDP price deflator. Original series: *PVGD*.

Oil prices (Equation (1)): Logarithm of UK Brent petroleum annual average spot price. Source: *Thomson Reuters*.

Panel-data regressions - Equation (7)

Fiscal Governance (1985-2004)

Delegation index: Captures the quality of budget institutions through the three phases: at the preparation stage, the budget draft is prepared; at the approval stage, the budget draft is reviewed and approved; and, at the implementation stage, the execution of the approved budget is scrutinised by the minister of finance and/or by parliament. We take the scores assigned to each phase of the budget process to construct our measure of Delegation index from Hallerberg et al. (2007), and Fabrizio and Mody (2008). We have only selected those items that are common to both papers to ensure harmonisation in the coding scheme of the three phases. For the former EU-15 countries, the index is based on information from Hallerberg et al. (2007) for the period 1985-1993, and from that period onwards, we use Fabrizio and Mody (2008).[21] For the CEEC we rely exclusively on Fabrizio and Mody (2008), who have based their index on data from Fabrizio and Mody (2006), who in turn had taken institutional scores from Gleich (2003) and Yläoutinen (2004).[22] The construction of the main index and of its sub-components assumes simple averages of scores (between 0 and 4) assigned to each phase (Table 11), rescaled to a range between 0 and 1. The indexes were normalised to have zero mean and standard deviation equal to 1.

Delegation and commitment dummies: Takes a value of 1 for states where the budget process is centralised in the finance minister (Delegation) and for states which have strong numerical budgetary targets shaping the budget process (Commitment). It takes a value of zero otherwise. The data comes from Annett (2006), who, in turn, relies on Hallerberg (2004) for the old EU-15 countries and on Yläoutinen (2004) for the new members, excluding Malta and Cyprus. It covers the 1981-2004 period.

[21] Data for France and Ireland are taken from Hallerberg et al. (2007) for all years, since Fabrizio and Mody (2008) do not provide results for them due to data availability problems.

[22] They do not cover Cyprus and Malta.

Table 11: Coding scheme for each phase of the budget process

Preparation Stage	**Numerical Coding**
1. General constraint	
Spending and debt as share of GDP	4
Spending as share of GDP or golden rule or limit on public borrowing	3
Balance and debt as share of GDP	2
Balance as share of GDP	1
None	0
2. Agenda setting	
MF or PM determines budget parameters to be observed by spending ministers	4
MF proposes nudget norms to be voted on by cabinet	3
Cabinet decides on budget norms first	2
MF or cabinet collects bids subject to the pre-agreed guidelines	1
MF or cabinet collects bids from spending ministers	0
3. Structure of negotiations	
Finance ministry holds bilateral negotiations with each spending ministry	4
Finance ministry holds multilateral negotiations	2
Approval Stage	
4. Parliamentary amendments of the budget	
Are not allowed, or required to be offsetting	4
Do not required to be offsetting	0
5. Relative power of the executive vis-à-vis the parliament; can cause fall of government?	
Yes	4
No	0
6. Sequence of votes	
Initial vote on total budget size or aggregates	4
Final vote on budget size or aggregates	0
Implementation Stage	
7. Procedure to react to a deterioration of the budget deficit due to unforeseen revenue shortfalls or expenditure increase	
MF can block expenditures	4
MF cannot block expenditures	2
8. Transfers of expenditures between chapters (i.e. ministries' budgets)	
Not allowed	4
Only possible within departments with MF consent	3.2
Only possible within departments	2.56
Require approval of parliament	1.92
Only if provided for in initial budget or with MF approval	1.28
Limited	0.64
Unlimited	0
9. Changes in the budget law during execution	
Only new budgetary law to be passed under the same regulations as the ordinary budget	4
Requires parliament consent	2
At total or large discretion of government	0
10. Carryover of unused funds to next fiscal year	
Not permitted	4
Limited and required authorization by the MF or parliament	2.66
Limited	1.33
Unlimited	0

Source: Hallerberg et al. (2007), and Fabrizio and Mody (2008).

Numerical Fiscal Rules (1990-2005)

Fiscal rule index: Taken from Debrun et al. (2008), this time-varying index summarises information on the coverage and strength of national numerical fiscal rules in force in the EU countries, except Bulgaria and Romania, over the period 1990-2005.[23] It is calculated by multiplying the share of government finances covered by rules, by an index of rules' strength based on scores assigned to five qualitative features: statutory basis, body in charge of monitoring, body in charge of enforcement, enforcement mechanism, and media visibility. It was normalised to have zero mean and standard deviation equal to 1. Its sub-groups, the expenditure rule index and the budget balance and debt rules index, are built using the same methodology.

Political (1980-2006)

Source: Database of Political Institutions (DPI) 2006 of the World Bank.

Electoral system: The nature of the electoral system takes a value of 1 for governments elected by proportional representation and 0 by majoritarian circles. Original series: *Pr*.

Elections: Dummy variable that takes a value of 1 in years where a parliamentary (legislative) election took place and 0 otherwise. For recent years, data for elections were updated using www.electionsguide.com. Original series: *Legelec*.

Herfindahl index: Measures the concentration of power in the parties. It is calculated as the sum of the squared seat shares of all parties in the parliament. Equals NA if there is no parliament or if there are no parties in the legislature. Original series: *Herftot*.

Electoral competitiveness: Index of electoral competitiveness that ranges from 1 to 16. Higher values translate into more electoral competitiveness and tighter

[23]The index is based on a survey conducted by the Working Group on the Quality of Public Finances (WGQPF) of the EC in 2006. In 2008, another survey was carried out to update the previous one, pointing to a slight increase in the number of fiscal rules in force in EU countries. This data has very recently been made available on http://ec.europa.eu/economy_finance/db_indicators/fiscal_governance/fiscal_rules/index_en.htm.

controls faced by governments. Original series: *Checks*.

Institutional (1980-2003)

Source: Cross National Time Series Database (CNTS).

Government crises: Counts the number of times of any rapidly developing situation that threatens to bring the downfall of the present regime. Original series: *S17F4*.

Cabinet changes: Counts the number of times in a year that a new premier is named and/or 50% of the cabinet posts are occupied by new ministers. Original series: *S22F2*.

Macroeconomic (1980-2007)

Source: European Commission AMECO database, Spring 2009 vintage.

GDP per capita: Logarithm of real gross domestic product per capita, measured at purchasing power parities (PPP). Original series: *UVGD* and *NPTD*.

Government size: The ratio of primary government expenditure to GDP at market prices. Original series: *UUTGIF* and *UUTGI*.

Country size: Logarithm of total population. Original series: *NPTD*.

Dependency ratio: The ratio of population under 15 and over 64 years to the workforce (those older than 15 and younger than 65). Original series: *NPCN*, *NPON* and *NPAN*.

Openness: The ratio of merchandise trade (exports plus imports) to GDP. Due to lack of data for Luxembourg for the period 1985-1998, the OECD Economic Outlook No. 86, November 2009 was used to fill this gap. Original series for exports and imports: *DXGT* and *DMGT*.

Inflation: Same variable as used in Equation (1).

Run-up to EMU: Dummy variable that takes a value of 1 for the former euro area-12 countries in the period 1994-1998. Greece assumes a value of 1 for the years

1996-2000.

SGP dummy: Dummy variable that assumes a value of 1 for euro area countries after the year 1998. Greece assumes a value of 1 from 2001 onwards, while Slovenia takes only a value of 1 in 2007.

New members: Dummy variable that assumes a value of 1 for the 10 Central and Eastern European Countries (CEEC).

Worldwide Governance Indicators (1996, 1998, 2000, 2002-2007)

Source: Worldwide Governance Indicators (WGI) from the World Bank.

Voice and accountability: Capturing perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media. The scores of this and the following indicators were normalised to have zero mean and standard deviation equal to 1, ranging from -2.5 to 2.5 (higher scores corresponding to better outcomes).

Political stability and absence of violence: Capturing perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including politically-motivated violence and terrorism.

Government effectiveness: Capturing perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, and the credibility of the government's commitment to such policies.

Regulatory quality: Capturing perceptions of the ability of the government to formulate and implement sound policies and regulations that promote private sector development.

Control of corruption: Capturing perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests.

C Institutions' quality indexes, data updates and policy volatility

Table 12: Evolution of the quality of institutions by decade

	1980s		1990s		2000s		Δ (2000s -1990s)	
	Delegation index	FRI	Delegation index	FRI	Delegation index	FRI	Delegation index	
Austria	-1.0	-0.8	-0.3	0.4	0.6	1.2	0.9	
Belgium	-1.4	0.8	-0.5	0.6	0.3	-0.2	0.8	
Czech Republic	-	-	-	0.1	0.2	-	-	
Denmark	0.6	0.7	0.1	2.0	-0.1	1.2	-0.2	
Estonia	-	0.9	0.8	1.6	1.2	0.8	0.4	
Finland	-0.5	-0.1	-0.4	1.5	-0.1	1.6	0.3	
France	2.2	-0.3	2.2	0.2	1.6	0.6	-0.6	
Germany	0.2	1.1	0.2	1.1	0.2	0.0	0.0	
Greece	-1.4	-0.9	-1.0	-0.9	1.0	0.0	2.0	
Hungary	-	-0.7	-1.8	-0.5	-1.8	0.2	0.0	
Ireland	-0.5	-0.9	-0.5	-0.7	1.1	0.2	1.7	
Italy	-2.2	-0.9	-1.0	-0.1	0.3	0.8	1.3	
Latvia	-	-0.4	0.5	-0.4	0.5	0.0	0.0	
Lithuania	-	-0.2	0.1	0.3	-0.1	0.5	-0.2	
Luxembourg	0.4	-0.3	1.0	1.6	1.6	1.9	0.7	
Malta	-	-	-	-0.9	-	-	-	
Netherlands	-0.5	0.7	-0.3	1.7	-0.1	1.0	0.3	
Poland	-	-0.2	-0.4	1.3	0.5	1.5	0.9	
Portugal	-0.4	-0.9	-0.5	-0.6	-0.8	0.2	-0.3	
Romania	-	-	-	-	0.2	-	-	
Slovakia	-	-0.9	-1.7	-0.1	-1.7	0.7	0.0	
Slovenia	-	-	-	0.5	-0.3	-	-	
Spain	-2.0	-0.1	-0.5	0.9	-0.1	1.0	0.5	
Sweden	-0.5	-0.4	-0.3	1.6	1.2	2.1	1.5	
United Kingdom	0.8	0.1	1.3	2.3	1.9	2.2	0.6	
Correlation		0.293		-0.098				

Source: Hallerberg et al. (2007), Debrun at al. (2008), Fabrizio and Mody (2008), and authors' calculations.

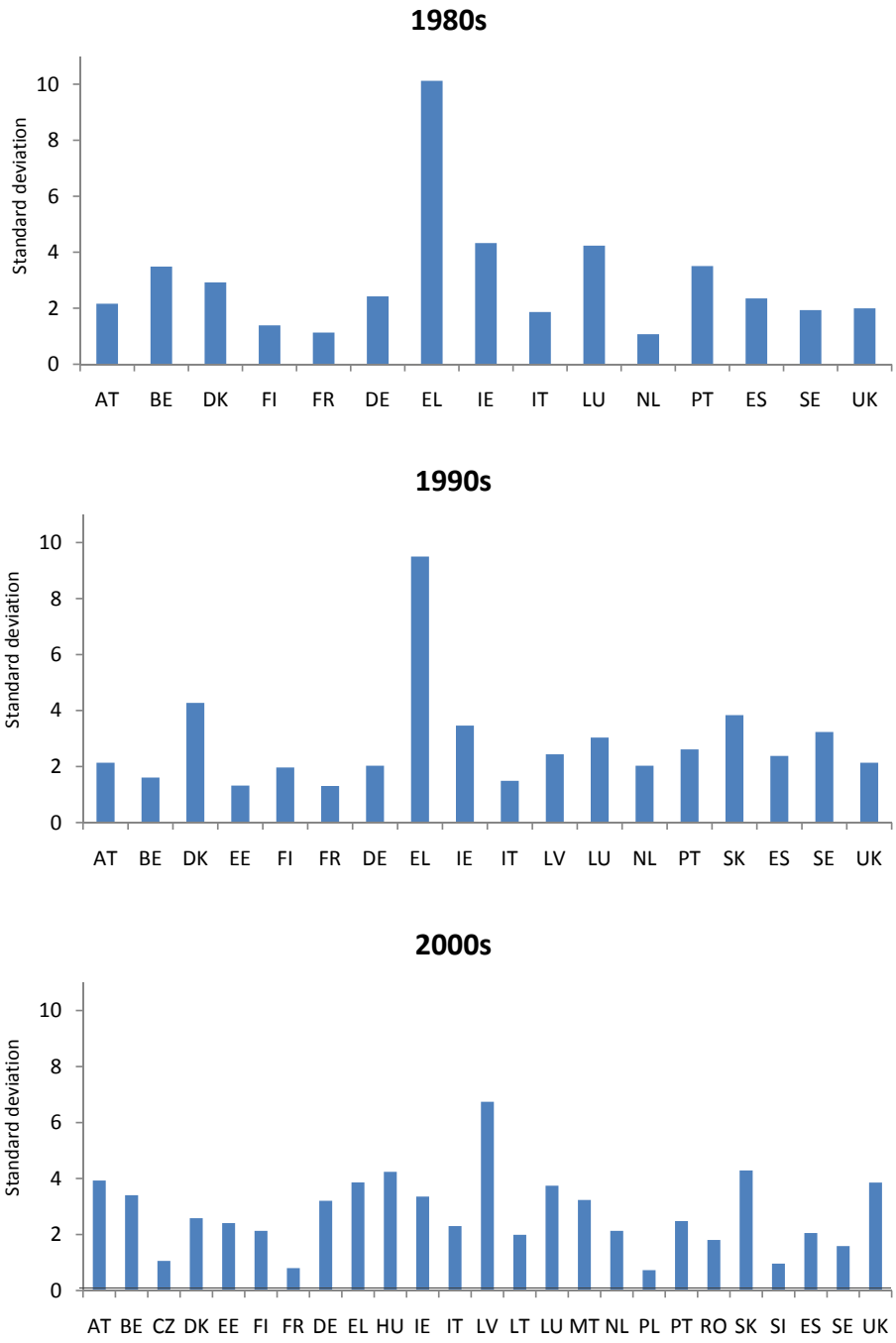
Table 13: Use of ESA 79 data

	Primary Expenditure	Public Consumption	CAPE
Greece	1980-1987	1980-1987	1980-1987
Ireland	1980-1984	1980-1984	1980-1984
Luxembourg	1980-1987*	1980-1989	1980-1989
Spain	1980-1994	1980-1994	1980-1994
Sweden	1980-1992	1980-1992	1980-1992

Note: For each variable we report the time period where ESA 79 was used.

*: for 1988-1989 it was used the OECD Economic Outlook No. 86, November 2009.

Figure 1: Volatility of discretionary fiscal policy for each country



Source: Authors' calculations.
Note: The calculated volatilities are from the baseline specification (primary expenditure).

References

Afonso, A. and Furceri, D. (2008), Government Size Composition, Volatility and Economic Growth. ECB *Working Paper Series* **849**.

Afonso, A. and Hauptmeier, S. (2009), Fiscal Behaviour in the European Union: Rules, Fiscal Decentralization and Government Indebtedness. *ISEG - School of Economics and Management Working Paper Series* **23**.

Afonso, A., Agnello, L. and Furceri, D. (2008), Fiscal Policy Responsiveness, Persistence and Discretion. *ECB Working Papers Series* **954**.

Agnello, A. and Sousa, R. (2009), The Determinants of Public Deficit Volatility. *ECB Working Paper Series* **1042**.

Alesina, A. (1987), Macroeconomic Policy in a Two-Party System as a Repeated Game. *Quarterly Journal of Economics* **102** (3), 651-678.

Alesina, A. and Bayoumi, T. (1996), The Costs and Benefits of Fiscal Rules: Evidence from U.S. states. *NBER Working Paper* **5614**.

Alesina, A. And Perotti, R. (1994), The Political Economy of Budget Deficits. *NBER Working Paper* **4637**.

Alesina, A. and Perotti, R. (1996), Fiscal Expansions and Adjustment in OECD Economies. *Economic Policy* **21**, 205-240.

Alesina, A., Campante, F. and Tabellini, G. (2007), Why is Fiscal Policy often Procyclical?. Mimeo.

Annett, A. (2006), Enforcement and the Stability and Growth Pact: How Fiscal Policy Did and Did Not Change Under Europe's Fiscal Framework. *IMF Working Paper* **116**.

Badinger, H. (2008), Fiscal Rules, Discretionary Fiscal Policy and Macroeconomic Stability: An Empirical Assessment for OECD Countries. *Applied Economics* **41**,

829-847.

Baunsgaard, T. and Symansky, S. (2009), Automatic Fiscal Stabilizers. *IMF Staff Position Note*.

Besley, T. and Case, A. (2003), Political Institutions and Policy Choices: Evidence from the United States. *Journal of Economic Literature* **41** (1), 7-73.

Blanchard, O. and Perotti, R. (2002), An Empirical Characterization of the Dynamic Effects of Changes in Government Spending and Taxes on Output. *The Quarterly Journal of Economics* **117** (4), 1329-1368.

Debrun, X., Moulin, L., Turrini, A., Ayuso-i-Casals, J. and Kumar, M. (2008), Tied to the Mast? National Fiscal Rules in the European Union. *Economic Policy* **54**, 297-362.

European Commission (2006), *Public Finances in EMU 2006*. European Economy **3**.

Fabrizio, S. and Mody, A. (2006), Can Budget Institutions Counteract Political Indiscipline?. *IMF Working Paper* **123**.

Fabrizio, S. and Mody, A. (2008), Breaking the Impediments to Budgetary Reforms: Evidence from Europe. *IMF Working Paper* **82**.

Fatás, A. and Mihov, I. (2003), The Case for Restricting Fiscal Policy Discretion. *Quarterly Journal of Economics* **118** (4), 1419- 1447.

Fatás, A. and Mihov, I. (2006), The Macroeconomic Effects of Fiscal Rules in the US States. *Journal of Public Economics* **90**, 101-17.

Fatás, A. and Mihov, I. (2009), The Euro and Fiscal Policy. *NBER Working Paper* **14722**.

Furceri, D. (2007), Is Government Expenditure Volatility Harmful for Growth? A Cross-Country Analysis. *Fiscal Studies* **28** (1), 103-120

Furceri, D. and Poplawski, M. (2008), Government Spending Volatility and the Size of Nations. *ECB Working Paper Series* **924**.

Gleich, H. (2003), Budget Institutions and Fiscal Performance in Central and Eastern European Countries. *ECB Working Paper Series* **215**.

Hallerberg, M. (2004), *Domestic Budgets in a United Europe: Fiscal Governance from the End of Bretton Woods to EMU*. Cornell University Press.

Hallerberg, M., Strauch, R. and von Hagen, J. (2007), The Design of Fiscal Rules and Forms of Governance in European Union Countries. *European Journal of Political Economy* **23**, 338-359.

Henisz, W. (2000), The Institutional Environment for Economic Growth. *Economics and Politics* **12** (1), 1-31.

Kaufmann, D., Kraay, A. and Mastruzzi, M. (2009), Governance Matters VIII: Aggregate and Individual Governance Indicators for 1996-2008. *World Bank Policy Research Working Paper* **4978**.

Kopits, G. (2001), Fiscal Rules: Useful Policy Framework or Unnecessary Ornament? *IMF Working Paper* **145**.

Lane, P. (2003), The Cyclical Behaviour of Fiscal Policy: Evidence from the OECD. *Journal of Public Economics* **87** (12), 2661- 2675.

Levinson, A. (1998), Balanced Budgets and Business Cycles: Evidence from the States. *National Tax Journal* **51**.

Milesi-Ferretti, G.M., Perotti, R. and Rostagno, M. (2002), Electoral Systems and Public Spending. *Quarterly Journal of Economics* **118** (2), 609-657.

Nordhaus, W. (1975), The Political Business Cycle. *Review of Economic Studies*, **42** (2), 169-190.

Persson, T. (2001), Do Political Institutions Shape Economic Policy? *NBER Work-*

ing Paper **8214**.

Persson, T. and Tabellini, G. (2001), Political Institutions and Policy Outcomes: What Are the Stylized Facts? *CEPR Discussion Paper* **2872**.

Poterba, J. (1994), State Responses to Fiscal Crises: The Effects of Budgetary Institutions and Politics. *Journal of Political Economy* **102**, 799-821.

Ramey, G. and Ramey, V. (1995), Cross-Country Evidence on the Link between Volatility and Growth. *American Economic Review* **85**, 1138-1151.

Rogoff, K. and Sibert, A. (1988), Elections and Macroeconomic Policy Cycles. *Review of Economic Studies* **55** (1), 1-16.

Sachs, L. (1982), *Applied Statistics: A Handbook of Techniques*. New York: Springer-Verlag.

Stokey, N. (2002), "Rules versus Discretion" after Twenty-Five Years. In: Gertler,M. and Rogoff, K., (Ed) *NBER Macroeconomics Annual 2002*, pp.9-45. Cambridge, MA: MIT Press.

Verbeek, M. (2004), *A Guide to Modern Econometrics*. 2nd ed, John Wiley & Sons.

Wagner, G. and Elder, E. (2002), Fiscal Policy and Cyclical Fluctuations: An Investigation of U.S. State Budget Stabilization Funds. Manuscript.

Woo, J. (2003), Economic, Political, and Institutional Determinants of Public Deficits. *Journal of Public Economics* **87**, 387-426.

Wooldridge, J. (2002), *Econometric Analysis of Cross Section and Panel Data*. Cambridge. MA: The MIT Press.

Wyplosz, C. (2005), Fiscal Policy: Institutions versus Rules. *National Institute Economic Review* **191**, 70-84.

Yläoutinen, S. (2004), Fiscal Frameworks in the Central and Eastern European Countries. *Finnish Ministry of Finance Discussion Paper* **72**.